

OCTOBER 1954

# ROADS and STREETS

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HIGHWAYS - CONSTRUCTION

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INSERT?  
or  
MULTI-USE?



LOCATION: The Dalles Dam, 95 miles up the Columbia River from Portland, Oregon.

OPERATING CONDITIONS: Lava basalt formation which varied from medium hard to extreme hardness.

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for the best bit  
... for every job

**TIMKEN**  
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## Sawing Turnpike Paving Joints

(Pages 71-78)

## Lime Applied by Tanker for Stabilization

See page 4 for contents

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**Atkinson-Ostrander Construction Co. achieves  
best results with TIMKEN® carbide insert rock  
bits and TIMKEN Rock Bit Engineering Service**

On their first project at the Dalles Dam in Oregon, Atkinson-Ostrander Construction Company used Timken Rock Bit Engineering Service to determine the best bit for drilling a lava basalt formation varying from medium to extreme hardness. A Timken® carbide insert bit was selected which gave better results than any others tested.

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multi-use rock bit



Timken threaded  
carbide insert rock bit



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a faster working

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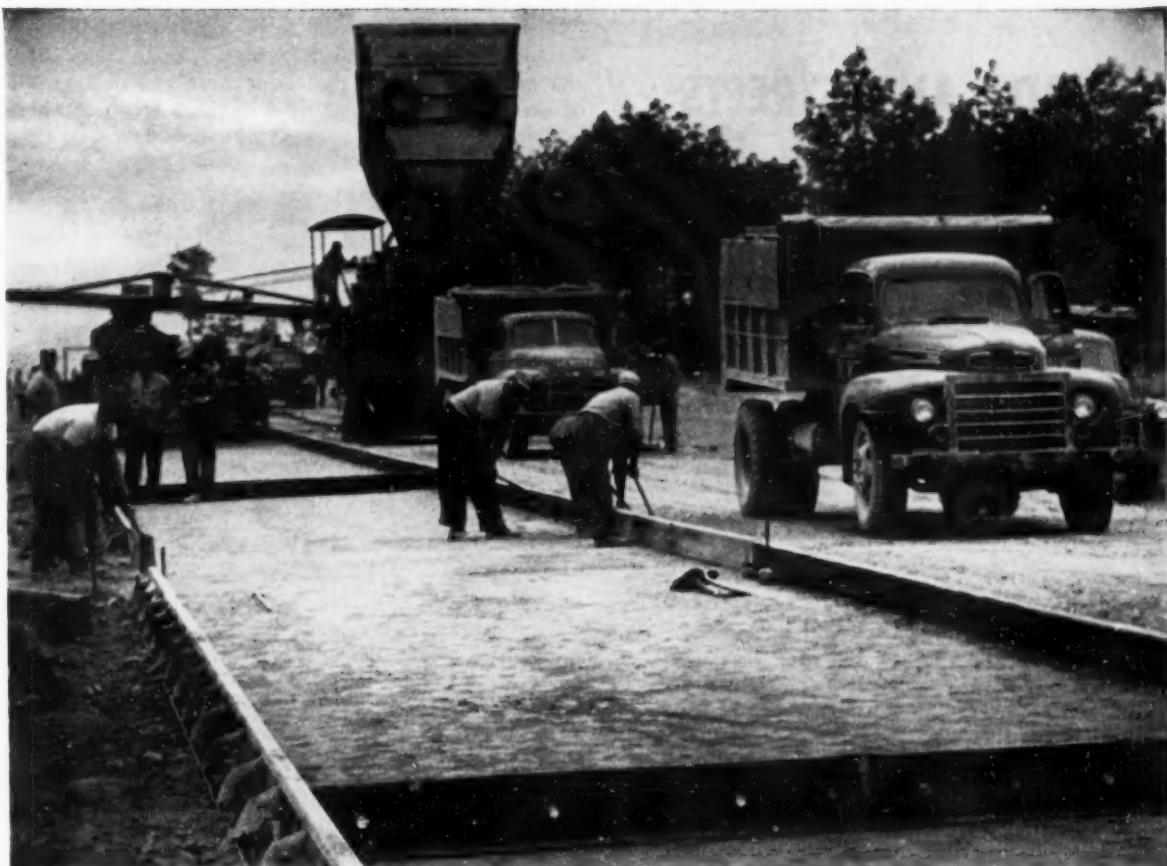
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Bethlehem dowel units being installed near Weedsport, N. Y., during the construction of that portion of the highway. Contractor: Potter DeWitt Corp., Pavilion, N. Y.

## World's Longest Express Highway Nears Completion

The New York Thruway is nearing completion. On it, a motorist will be able to travel north to Albany and all the way across New York state without a single stoplight or grade intersection.

The Thruway is designed for 70-mile-an-hour speeds. The pavement is finished to provide a tire gripping, non-skid surface in all types of weather. At all points along the highway there is 1000 ft forward vision, and land-

scaping is designed on a broad, sweeping scale to relieve monotony.

Opposing streams of traffic are separated by a grass medial strip varying from 20 to 150 ft wide and more. Steep grades have been eliminated, with maximum rises of 3 ft in every 100. Eighty per cent of the highway will be 4-lane, the remainder 6 lane.

The materials used in building the Thruway were selected for longevity. The 9-in. cement pavement rests on a 12-in. granular base. Concrete-reinforcing bars and dowel units are two of the Bethlehem Steel highway products being used at many points along the Thruway. In addition, Bethlehem structural steel was used in several hundred bridges and overpasses and Bethlehem guard rail, both beam and cable types, protects many miles of the highway.



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**BETHLEHEM STEEL**

The main route of the Thruway extends from New York City to Buffalo. When the entire system is completed, however, motorists can travel comparable highways from Buffalo north to Niagara Falls and south to Pennsylvania, and from Albany to Massachusetts.

**When writing advertisers please mention ROADS AND STREETS, October, 1954**

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Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 62 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892.

OCTOBER, 1954

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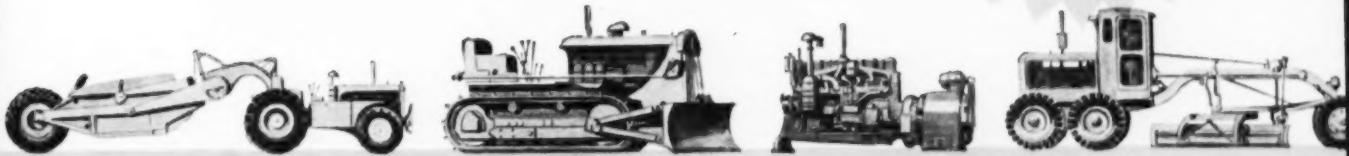
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(Advertisement)

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The publications listed below are available free on your request. Write to manufacturer giving title and job classification.

**TL-10 TRUCK CRANE JOB PICTURE BOOK** — Full page illustrations and job data on Lorain 6-ton turntable for mounting on your truck chassis in the field.

**TL-15 "SERIES" CATALOG** — Complete catalog of the  $\frac{1}{2}$  yd. class Lorains—crawler and rubber-tire mountings.

**MC-104 MOTO-CRANE CATALOG** — Shows construction details and job views of the lowest priced Lorain on Lorain-built rubber-tire carrier. Rated: 6-ton as crane— $\frac{1}{2}$  yd. as shovel.

**TL-25 "SERIES" CATALOG** — 32 pages on the  $\frac{1}{2}$  yd. Lorain (17½ tons as Moto-Crane). Covers Crawler, Moto-Crane and Self-Propelled mounted machines.

**TL "SERIES" PACKAGED COMPONENT DESIGN** — The inside story of the Thew-Lorain TL "Series." Lithographed in full color on transparent plastic. Shows major assemblies of turntable in cut-away views. Pages superimpose on one another to "build" the turntable.

**"50" SERIES CATALOG** — 24 pages, in 2 colors of details and job views of the Lorain crawler-mounted 1-yd. machines.

**"52" SERIES CATALOG** — Describes the companion rubber-tire machines to the "50" Series (30-ton rating as cranes).

**"42" SERIES CATALOG** — This series available as Moto-Cranes and Self-Propelled only. Rated at 22½ tons as cranes.

**"79" SERIES CATALOG** — Covers construction details of the  $1\frac{1}{2}$  yd. crawler Lorain.

**"80" SERIES CATALOG** — The  $1\frac{1}{4}$  yd. crawler-mounted Lorain is covered by this catalog.

**"820-K" SERIES CATALOG** — 24 pages, 2 colors. Detailed description and illustrations of the 2-yd. class Lorains. Covers all front ends.

**CHARGE-A-PAVER Book** — Describes a new front-end that lowers concrete paving costs. Includes operating procedure, pictures and details.

**LORAIN HOE Book** — The application of Hoes from  $\frac{1}{2}$  yd. to 2 yds. is graphically covered in 16 pages. Full page job illustrations—operating data.

**TIILT-UP CONSTRUCTION Book** — This book demonstrates in words and pictures the importance of Lorain Cranes to this growing construction technique.

**PARTS KITS CATALOGS** — Lorain Parts Kits for replacement and modernization are designed to save Lorain owners money. This 28-page catalog describes and illustrates those available.

**SCOOP SHOVEL Book** — Completely describes and illustrates the Lorain Scoop Shovel—a front-end attachment for stock-piling, mining and low headroom applications.

All of the above literature is available from The Thew Shovel Co., Lorain, Ohio.

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THE THEW SHOVEL CO., LORAIN, OHIO



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### HYDRAULIC COUPLING

Digging shocks and impacts "melt away". Engine can't stall in any digging. A standard "50" feature, that costs you nothing extra.

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OFFERING MORE THAN 136 SHOVEL-CRANE  
COMBINATIONS ON CRAWLERS OR RUBBER-TIRES  
TO BEST FIT YOUR JOB FOR PROFIT

# OPERATION: Blue Jay at Thule, Greenland



Three years ago the Army Corps of Engineers was ordered to rush construction of a giant air base at Thule in the Arctic region of northern Greenland. Architects, engineers and contractors were faced with tremendous new problems in this land of continual ice and snow where winds blow up to 150 miles an hour and temperatures drop to 30 or 40 below.

It was a big job with 12,368,000 cu. yds. of heavy excavation and fill. Because of its importance to our national defense, it had to be completed on schedule. The selection of earth moving equipment for Thule had to be made carefully for men and machines would work under the most adverse conditions . . . and they had to keep working round the clock until the project was completed.

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**EUCLID DIVISION**  
GENERAL MOTORS CORPORATION  
Cleveland 17, Ohio



# Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



# *Introducing... Most power! Most speed in the heavy-duty, $\frac{3}{4}$ -yard class!*



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LINK-BELT SPEEDER does it again! LS-88 is the first heavy-duty  $\frac{3}{4}$ -yard shovel-crane with world-famous Speed-o-Matic power hydraulic control! This exclusive feature puts the operator in a class by himself. He works easier, faster, with less fatigue. Also, greater net hp puts more production at his fingertips.

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### **SPECIAL NOTE TO TODAY'S SHOVEL-CRANE BUYERS**

Before you buy a shovel-crane of *any* capacity for *any* application, check first with your Link-Belt Speeder distributor. Link-Belt Speeder is moving ahead with several great new machines—available NOW and offering exclusive advantages for you!

**LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa**

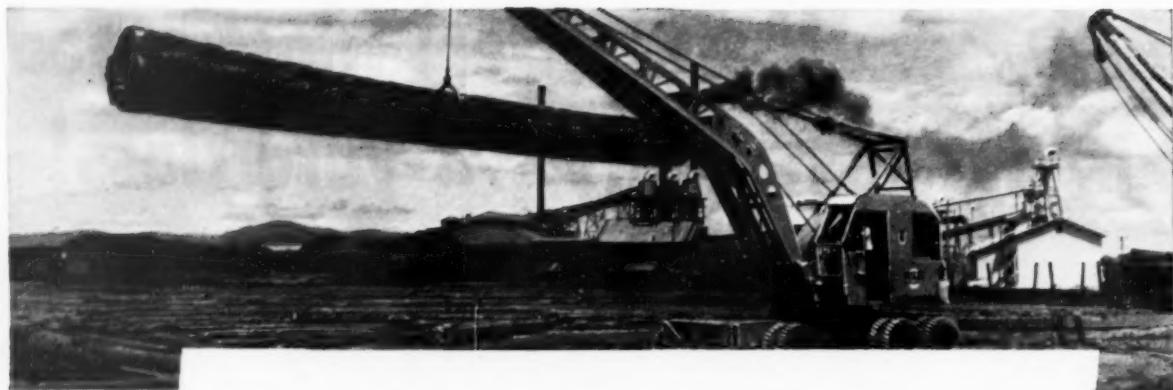
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- Patented advanced crawler—self-cleaning, smoother travel, longer life.
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- Splined shafting and anti-friction bearings throughout upper main machinery.

13-873-A

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And they produce the additional air at moderate temperatures, with notably low fuel consumption and, we believe, the lowest cost of upkeep. Ask your Jaeger distributor to show what he can save you on air and air tool operation — or send for Catalog.

<b>Jaeger Standards:</b>	<b>75</b>	<b>125</b>	<b>185</b>	<b>250</b>	<b>365</b>	<b>600</b>
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# designed with dozing in mind

**ALLIS-CHALMERS HD-5**  
**50 belt hp — 11,250 lb**



In its weight and power class, only the Allis-Chalmers HD-5 crawler gives you a tractor that is new in design and built with bulldozing in mind — with a main frame that is designed for front-mounted equipment, built-in provision for hydraulic pump, reduced front-end overhang, and better over-all balance. That is why the HD-5 does more work in its power range — at a lower cost and with less down time.

**BUILT FOR TODAY'S JOBS.** The pace-setting design of the HD-5 gives you important margins of safety in power, strength, and balance for longer, more productive tractor life. Each part is designed and built with a new standard of performance to meet today's increased use of tractor-mounted equipment.

**BALANCED WEIGHT.** The Allis-Chalmers all-steel, welded box A-type main frame eliminates dead weight and permits the weight to be placed where it will add to working strength and to tractor balance. For instance, the strong, heavy truck frames keep tracks in line constantly, contribute to better weight distribution and a lower center of gravity — with improved bulldozing and longer life.

**ENGINE-MOUNTED DOZER.** The box A-type main frame also permits the use of an engine-mounted dozer, with blade located close to the tracks for improved overall balance, greater strength, and more accurate blading. This type of construction provides direct down pressure on the blade, eliminates heavy, bulky mountings that clog with material and debris, gives better accessibility for inspection and servicing.

**GREATER GROUND CLEARANCE.** Double reduction final drives provide ample ground clearance to take advantage of the HD-5's low center of gravity and full traction in mud, soft footing, or rough going.

**Plus These Additional Money-Saving Features:**  
1,000-hour lubrication intervals for truck wheels, idlers, and support rollers saves time, cuts labor cost . . . unit construction for easy servicing, because box A-type main frame makes major assemblies readily accessible for inspection, adjustment, and servicing . . . operator comfort second to none, with convenient controls, full vision, easy steering, and simplified shifting.

*Write for detailed literature or contact your Allis-Chalmers dealer. He will be glad to demonstrate the advantages of the HD-5.*

**ALLIS-CHALMERS**  
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

**You've never before seen Compaction like this!**



Announcing the new and revolutionary  
**Buffalo-Springfield Kompactor**

What do we mean by "new"? There's *never* been anything like it before!

Why do we say "revolutionary"? Because the Kompactor is changing *drastically* the time and cost elements in soil compaction jobs!

Here are the spectacular results of tests in the field:

**The Kompactor has met density requirements in one fourth the number of passes required with large sheepfoot, vibrating, or heavy pneumatic-tired rollers. One contractor reports a cost savings of 50% on an embankment job!**

The Kompactor is self-propelled, reversible, and easy to maneuver on steep embankments, can work in close to abutments, culverts, etc.

*There's a Buffalo-Springfield Distributor conveniently located to serve you.*



The unique rolls of the Kompactor are *segmented*. The staggered "islands" that form the rolling surface enter loose material with minimum displacement, either forward or horizontally. They leave without disturbing compacted areas in any way. All compaction effort is *downward*, resulting in greater and more uniform density from lower elevations to top surface. As a result, *two passes with the Kompactor will often meet density requirements!*

Before you bid another soil compaction job, find out more about the Buffalo-Springfield Kompactor. It may completely change your time and cost picture, give you a clear-cut advantage in bidding those close jobs!

*Write today for full information.*

**The Buffalo-Springfield Roller Co.**  
Springfield, Ohio

**BUFFALO** THE STANDARD OF COMPARISON **SPRINGFIELD**  
SPRINGFIELD, OHIO

THE LEADER IN ROAD ROLLER DESIGN AND MANUFACTURE.

# MEET MISTER 4X4!

**INTERNATIONAL four-wheel-drive trucks** bring to construction men and contractors entirely new 4x4 performance and efficiency. These new four-wheel-drive trucks combine famous INTERNATIONAL stamina, long life, and operating economy with everything that's new and best in 4x4 design.

A two-speed transfer case affords eight forward and two reverse speeds, permitting movement of men, tools, and equipment over all kinds of terrain. Two transmission power take-off openings allow operation of front-mounted winch, hydraulic hoist, or other auxiliary equipment. There is provision for mounting a third power take-off on the transfer case.

**INTERNATIONAL 4x4 trucks** have everything it takes for tough construction assignments, plus extra easy steering and handling, famous driver-designed Comfo-Vision cabs. Study the extra-value facts shown here, then get complete details from your INTERNATIONAL Dealer or Branch.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

## America's Finest Four-Wheel-Drive Trucks

**Two chassis models:** Model R-140 (4x4), 130- and 142-inch wheelbases, GVW rating, 11,000 pounds. Model R-160 (4x4), 154- and 172-inch wheelbases, GVW rating, 15,000 pounds.

**All-truck power:** Both models powered by famous INTERNATIONAL Silver Diamond engines.

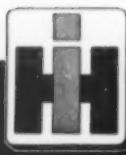
**Transmission:** Sliding gear selective type. Four speeds forward, one reverse. Power take-off openings on right and left sides.

**Transfer case:** Two-speed declutching type, providing eight forward and two reverse speeds, with manual disengagement of front axle for normal two-wheel-drive operation. Three-position shifting —high, 1.00 to 1; low, 1.87 to 1; and neutral. Provision for mounting full torque power take-off at rear of input shaft.

**Four-wheel-drive INTERNATIONALS** provide new standards of efficiency and stamina for a wide variety of construction jobs. Shown is an R-140 (4x4) with portable compressor mounted on flat-bed body.



International Harvester Builds MCCORMICK® Farm Equipment and FARMALL® Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers  
See the season's new TV hit, "The Halls of Ivy," with the Ronald Colmans, Tuesdays, CBS-TV, 8:30 p.m., EST, starting October 19th



## INTERNATIONAL TRUCKS

*Standard of the Highway™*



# 11 Attachments .. to 1 Basic Unit

## CUT INVENTORY— LABOR—MAINTENANCE!

*the* **PIT-BULL...**

- MOUNTS ON REAR OF FERGUSON OR FORD TRACTOR.
- HAS FOUR SPEEDS EACH DIRECTION AND INSTANT REVERSING.
- PERMITS CLEAR VISION AND PERFECT CONTROL.
- ATTACHMENTS ARE EASY TO CHANGE.

Replace your high-cost equipment with the high-quality yet economical Davis **Pit-Bull**. Only one basic unit...but several easy-to-change attachments set you up to handle a multitude of jobs without a big investment in equipment and payroll. The **Pit-Bull** is strictly a one-man machine that can be used to load...dig...sweep or to do many other jobs with a minimum of time spent changing attachments. You buy only the attachments you need.

The **Pit-Bull** turns your Ferguson or Ford tractor into a powerful industrial unit. A syncro-mesh transmission with underdrive is installed by the dealer to give you four speeds in either direction and to allow you to change without shifting gears.

A reversal in the seating and steering controls, plus installation of finger-tip **Pit-Bull** controls, permits the operator to be comfortable and maintain complete control of both the tractor and the **Pit-Bull** simultaneously. The **Pit-Bull** gives greater versatility, maneuverability, visibility and performance at only a fraction of the cost of conventional equipment.

Ask your dealer for a demonstration or write for details.

**The Davis PIT-BULL is manufactured by the makers of the Davis Model 100 Loader, America's Quality, Front-End Tractor Loader.**



Back-Hoe



Rotary Broom



Rotary Mower



Fork Lift



Trencher



Dozer



Post Auger



Hammer



Swinging Crane



Cab Attachment



Model 100 Loader

**SEND THIS COUPON FOR FREE LITERATURE**

MID-WESTERN INDUSTRIES, INC.  
1009 S. WEST ST., DEPT. R  
WICHITA, KANSAS

PB-4

Send me literature on the Pit-Bull  I would also like literature on the DAVIS Model 100 Loader to fit a tractor.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_



**MID-WESTERN INDUSTRIES, INC.**

1009 S. WEST ST., WICHITA, KANSAS

**DEMONSTRATE TO YOURSELF**

# The Swing's The Thing FOR FASTER LOADING!

## Pettibone SPEED SWING 180° Boom Cuts Loading Time Up To 25%

Ever consider the extra profits you could make getting material loaded faster? A whole new, time-saving, space-saving loading concept is being practiced by cost-conscious contractors and governmental units who are using Speed Swing. It loads faster, in less space, to the left or right, without moving from its short, single working line (see diagram below). Ask for free demonstration!

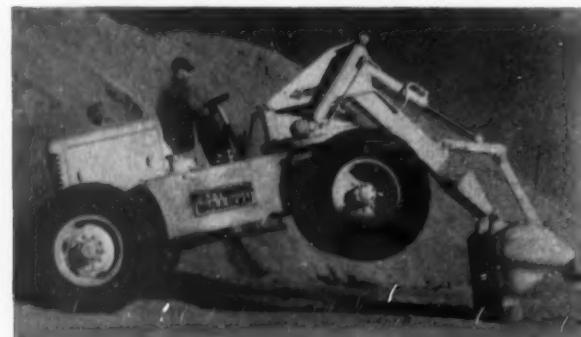
All This Plus Torque Converter Power



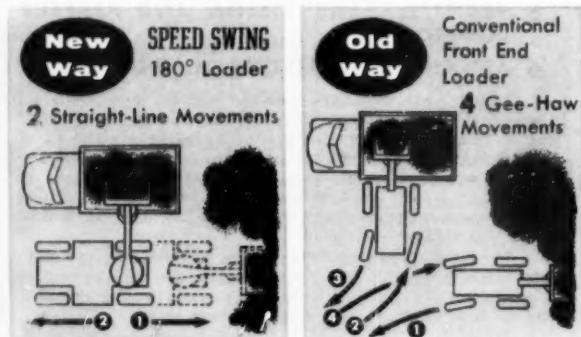
Longest Forward Reach of Any Loader! 5 ft. 4 in. reach from tires at 7 ft. dumping clearance also permits loading trucks far forward.



30° Bucket Tilt-up! Full loads are assured every time. 4 wheel drive, big flotation tires, and torque converter produce powerful crowd.

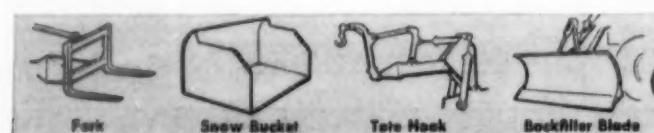


Powerful Down Pressure! Never any worry about holding grades. Boom may be placed in float control position for leveling.



**PETTIBONE**

**SPEED SWING**



Another Member of the Labor-Saving  
"Speedy" Material Handling Family!

**PETTIBONE MULLIKEN CORP.**

4700 W. Division • Chicago 51 • SPaulding 2-9300

## ROADS AND STREETS

# Washington News Letter



By Duane L. Cronk

October 8, 1954

Some of the experimental provisions of the 1954 Federal-Aid Highway Act are being activated by interpretations now coming out of the B.P.R.

One of these is the so-called "Secondary Road Plan" whereby the bureau can withdraw from its former responsibilities in secondary road construction by accepting a request from a state that it do so.

The state highway department in making such request must describe the manner in which it will acquire rights-of-way, prepare plans and specifications, let contracts, and supervise work. It must also report what limitations it will impose on the use of force account.

\* \* \*

Contractors are concerned about this point. Heretofore contract construction has been assured on all federal-aid secondary roads by bureau requirement. Federal-aid work has been 99% contract work.

That states will possibly elect to do more of their own construction or allow their counties to build up force account volume is recognized by the bureau. Whenever force account construction shows a "substantial" increase in a state, however, the commissioner may ask that the trend be halted.

Recognition of the danger was made by Congressman Harry McGregor, also, last month. The chairman of the House Subcommittee on Roads told a gathering of county engineers that if they went "hog-wild" for force account they would certainly bring the federal government back into the secondary roads picture.

\* \* \*

States can build their secondary roads to their own standards under the new plan - another cause of concern to some highway men. Relinquishment of bureau standards is bound to invite low quality work, they say. (County officials have frequently blamed Washington for what they considered unnecessarily rigid specifications.)

Others point out that state highway departments are frequently more strict than the bureau, and that they will have to defend those standards alone now.

(continued on next page)

Last month, Wisconsin became the first state to seek admission to the new plan. No state is required to come under the arrangement, and it will continue to receive its share of federal aid whether it asks the bureau to get out of its secondary roads operation or not. For reasons of their own, some will undoubtedly not.

\* \* \*

Full financial responsibility for the interstate system of highways should be shouldered by the federal government, American Trucking Associations spokesmen are advocating these days. The ATA wants a 10-year, \$20-billion program of construction on the 38,000-mile network.

Uncle Sam would put up all the money, and the states would build the roads as they do now. The necessary \$2 billion per year could come from automotive excise tax revenues and from general federal funds, ATA believes. This would be in addition to the federal aid matching funds for primary, secondary and urban highways.

\* \* \*

General optimism over the prospects of increasing highway work was reflected in the latest survey of business conditions conducted by the Associated General Contractors of America. Fifty-nine per cent of the A.G.C.'s 124 chapters and national directors predicted last month that the volume of road construction would rise during the next six months. Twenty-six per cent saw a continuation of the present high level, and only 15% saw a decrease ahead.

Much keener competition among contractors was reported by 89% of those polled, and a number described the bidding situation as "extremely intense."

Increasing competition among highway builders was also indicated in the most recent compilation of bids on federal-aid work for the first half of this year. There was an average of seven bidders per project during that period, compared to five bidders per job in 1952 and 3.9 bidders in 1946.

\* \* \*

About \$6.4 billion will be spent on highways this year by all segments of government, Undersecretary of Commerce for Transportation Robert B. Murray, Jr., revealed last month.

The states will put up 69% of that total, Murray said, counties and cities, 22%; and the federal government, 9%.

Federal policy on toll roads has been revised, also, Murray reported, and toll roads are now regarded as "a sound solution for many of the costly deficiencies on our national system of interstate highways."

\* \* \*

**H ON THE SUPER HIGHWAYS**



**INTERNATIONAL PAYSCRAPERS  
and crawlers help contractors  
carve 88 mile roadway  
through mountainous terrain.**

With the opening of the new West Virginia Turnpike, travel distance between Charleston and Princeton shrinks from 110 to 88 miles, a 20% reduction in mileage over a two-lane road that makes driving through the mountains faster and far safer.

While not as long as some of the other new Turnpikes, this \$96,000,000 road-building venture was a rugged test for contractors from the outset with original estimates of 25,000,000 cubic yards of earthmoving increased by mountain slides that required moving more than 500,000 yards of dirt for each mile of highway built in many locations.

This mountainous setting provided contractors with more concrete evidence that INTERNATIONAL tractors—both rubber-tired and crawler—really pay off big when the chips are down... when greater power, payload moving capacity and maneuverability are needed in the tight spots.

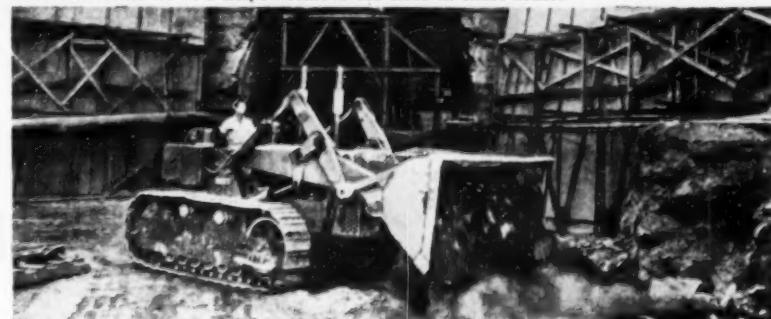
It takes just 10 seconds to get the low-down on International's greater earthmoving earning power. Simply call your International Industrial Distributor today and he'll demonstrate any of the great INTERNATIONAL tractors with matched equipment right on your job tomorrow.

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS

# Carving out the West Virginia Turnpike



A MOUNTAIN SLIDE nearly doubled the excavation work of the L. S. Coleman Company, St. Albans, West Virginia, in Kanawha County, but two INTERNATIONAL TD-24's and two INTERNATIONAL 2T-75's helped remove the slide in short order.



TITAN IN A TUNNEL. Bates and Rogers Construction Corp., Chicago, find the INTERNATIONAL TD-18A crawler and 3 cu. yd. DROTT Skid-Shovel a great all-around performer in constructing half-mile tunnel between Standard and Fairfield, West Virginia.



LATROBE LIKES 'EM. "We put our 3 TD-24s on the tough jobs because of the extra power and speed, their all-around efficiency and stamina," says John Sobotta, grade foreman for Latrobe Road Construction Co., Latrobe, Penn., contractors on 3,000,-000 cubic yards of excavation and embankment in Raleigh County.



## INTERNATIONAL®

FOR EVERY MOVE IN EARTHMOVING



## "I was promised delivery today,

but now I'm told you've no stock of one rope and only half enough of another. This delay is costing me money and plenty of it. From now on it's Roebling for me!"

\*\*\*

You can count on prompt and full delivery of Roebling wire rope. Your nearest Roebling office and distributor will help you choose the rope that will perform and stand up best in excavating and construction service. And you'll get what you want, when you want it — straight from nearby warehouse stock.

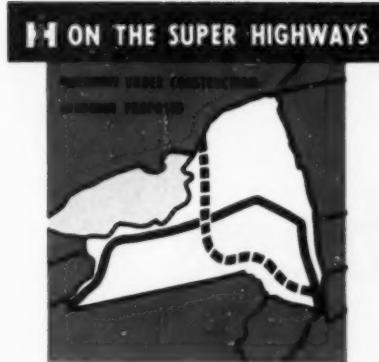


**ROEBLING** CF

Subsidiary of The Colorado Fuel and Iron Corporation



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J.  
BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5555 W. RODEVELL RD. • CINCINNATI, 3255 FREDOMIA AVE. • CLEVELAND, 19325 LAKWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLVD. • HOUSTON, 2816 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 VECTOB ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 905 1ST AVE. S. • TULSA, 331 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.



# Pushing Completion of New York Thruway

**Contractors get big assist from INTERNATIONAL TD-24s as \$823 million super road enters final construction stage.**

The New York Thruway is now a year from completion . . . 427 miles long with four authorized extensions totaling another 128 miles . . . \$823 million projected construction cost . . . approximately 80,000,000 cubic yards of rock and stone to be moved.

Road builders on the Thruway from New York City to Buffalo have banked on INTERNATIONAL TD-24s to keep them on schedule . . . clearing the right of way . . . pulling bigger scraper loads faster than any other crawler . . . pushing elevating loaders . . . push-loading like no other crawler can . . . leveling and compacting fills.

Whether you handle big Thruway contracts or do custom work, your International Industrial Distributor is the fellow for you to call today for demonstration proof of how the complete INTERNATIONAL line of nine crawler and rubber-tired tractors can cut your costs.

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS



250 LOADS IN 10 HOURS is the production pace maintained by these 3 TD-24s and scrapers for the Savin Construction Corp., Hartford, Conn., on one of four contracts the firm has on the Thruway in Greene County. Savin uses 7 TD-24s to move 6 million cubic yards.



SUPT. RATES TD-24s TOPS. "Our INTERNATIONAL TD-24s and scrapers deliver paydirt faster than any others on the job—usually more than 100 loads each in 10 hours," says J. P. Connor, superintendent for Smith Construction Company, Pelham, N. Y., subcontractors of 1,500,000 cubic yards of earthmoving.



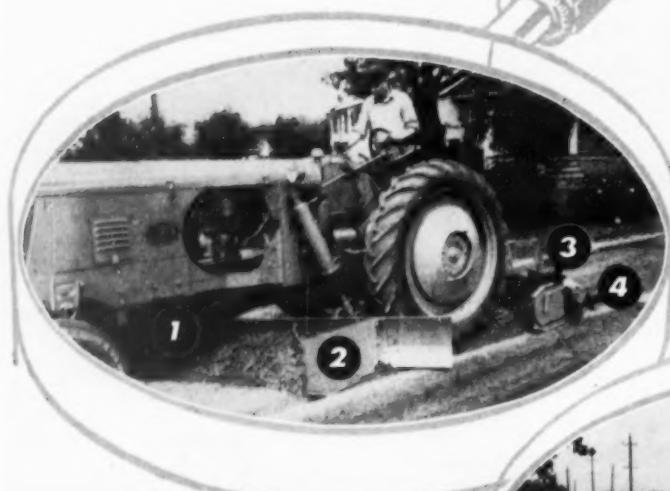
BEARCATS IN THE BORROW PIT are these two INTERNATIONAL TD-24s used by Arute Brothers, Inc., New Britain, Conn., on two Thruway prime contracts totaling \$3,082,905 in Monroe County. Four TD-24s are used for push-and-pull loading and for leveling the fill.



## INTERNATIONAL®

FOR EVERY MOVE IN EARTHMOVING

# HOW HUBER SOLVES Two Special Problems



## SMOOTH BERMS IN ONE PASS

Hydraulically controlled blade (1) pulls in berm material to edge of pavement where gathering blade (2) carries it until needed to fill low spots. Rear wheel compresses fill material. Hydraulically controlled berm leveler (3) removes and feathers-out excess material. Cleaner blade (4) sweeps pavement clean.



## CLEANING UNDER GUARD RAILS

Huber Side Dozer attachment enables Maintainer to scalp berms and shoulders under any guard rail 6" or more off ground. Hydraulic action pushes 48"x6" blade to remove sod and gravel, formerly a laborious hand operation. Side dozer has 72" reach.

## THESE ARE ONLY TWO OF THE JOBS

a versatile Huber Maintainer can do. Other attachments convert it to a bulldozer, lift loader, highway mower, snow plow, broom, road planer or patch roller. Its 42½ horsepower puts a heavy push behind its 9-foot moldboard, and its 6,000-pound weight, ability to travel at pick-up truck speeds and to turn and work in close quarters make it a favorite tool for many classes of work.

## NOTE TO CONTRACTORS

Talk with the political subdivisions in your area about handling their berm leveling and guard rail cleaning problems on a contract basis.



HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.  
Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

H ON THE SUPER HIGHWAYS



# Extending the Maine Turnpike

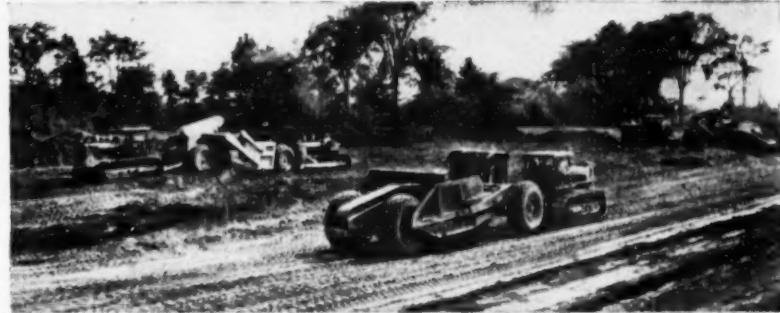
**Contractors using fleets of  
INTERNATIONAL TD-24 crawlers  
to complete 67.5 mile  
Portland to Augusta addition**

With traffic on the present Maine Turnpike running 10 years ahead of estimates, the pressure is on to complete the 67.5-mile Maine Turnpike Extension from the Portland by-pass to the outskirts of Augusta.

And contractors all along the Turnpike Extension are off-setting a six weeks' delay due to rain in early summer by using fleets of big 155 drawbar horsepower INTERNATIONAL TD-24 crawlers to make the dirt fly . . . hauling dense scraper loads . . . push-loading as no other crawler can . . . towing 50-ton compactors . . . every bulldozing job on the right of way from pioneering to finish grading.

Match the production of these INTERNATIONAL earthmovers against your present equipment tomorrow by calling your International Industrial Distributor today for your on-the-job demonstration.

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS



DIGGIN' IN FOR DEMATTEO. "After six weeks of rain it's mighty nice to see our TD-24s delivering 24 cubic yard payloads to help us get back on schedule" reports F. L. Kirby, superintendent for DeMatteo Construction Company, Quincy, Mass. Eight TD-24s are on the job.



PACIN' THE BIG DIPPERS. Latrobe Road Construction Co., Inc., Latrobe, Penn. uses three TD-24s on its subcontract with Savin and Supt. F. E. Crowell states, "The TD-24 is the only crawler, bar none, that's been able to keep ahead of our big shovel operations".



IT'S TD-24S 9 TO 5. The Savin Construction Corp., East Hartford, Conn. uses 9 INTERNATIONAL TD-24s on its 10.585 section of the Turnpike to move 2,000,000 cubic yards of earth and 90,000 cubic yards of rock. Three TD-24s shown compacting a fill near Portland.



## INTERNATIONAL®

FOR EVERY MOVE IN EARTHMOVING



## TURNER TURNPIKE USES 50 MILES OF FLEX-BEAM GUARDRAIL

Oklahoma motorists are assured maximum safety with the almost 50 miles of Armco FLEX-BEAM Guardrail used on the Turner Turnpike and its approaches.

Since 1939, Armco FLEX-BEAM Guardrail has been used on the leading highways of the country. More and more turnpikes, super-highways and parkways are turning to this strong, highly-visible, almost maintenance-free guardrail. And yet, because of its low installed cost, FLEX-BEAM is also widely used on secondary and county roads.

Installation is easy and fast. Small crews simply install posts at 12-foot intervals and bolt on the guardrail—that's all.

FLEX-BEAM is especially designed to minimize the effect of accidents, both to the auto and the guardrail itself. Even if severe impact damages a few sections, the rest of the guardrail continues to provide full protection. And it's simple to replace damaged sections.

Write us today for factual details on Armco FLEX-BEAM Guardrail. Armco Drainage & Metal Products, Inc., 3544 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

### OTHER NOTABLE FLEX-BEAM INSTALLATIONS

- WEST VIRGINIA TURNPIKE
- NEW JERSEY TURNPIKE
- MAINE TURNPIKE
- OHIO TURNPIKE

## ARMCO FLEX-BEAM GUARDRAIL



ON THE SUPER HIGHWAYS



— UNDER CONSTRUCTION  
■ ■ ■ PROPOSED

## INTERNATIONAL TD-24 crawler tractors preferred by contractors on toughest phases of Ohio Turnpike construction

An estimated 29,506,100 cubic yards of earth and rock is being excavated and an estimated 46,905,000 cubic yards of borrow and fill will be moved before the great new 241.1 mile Ohio Turnpike is completed.

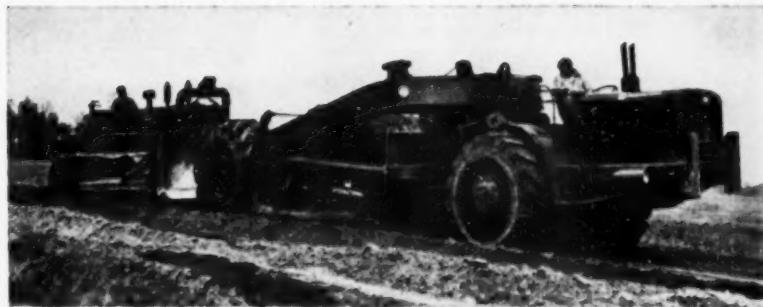
All along the Ohio Turnpike, from the eastern terminus in Mahoning County to the western terminus in Williams County, INTERNATIONAL TD-24 crawler tractors are taking over the toughest earthmoving jobs.

With 155 drawbar horsepower, the INTERNATIONAL TD-24 can conquer any big job. And the durability of every TD-24 means less maintenance, downtime, and operating expense, more profit for owners.

For full details or an on-the-job demonstration with the TD-24 or any of the other six great INTERNATIONAL crawlers and two rubber-tired tractors with scrapers or bottom dump wagon, call your International Industrial Distributor today.

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS

# Opening up the Ohio Turnpike



HEAP LOADS IN A HURRY. One of Julian Construction Company's seven TD-24s push-loads a new INTERNATIONAL 2T-75 two-wheeled rubber-tired tractor near Wauseon, Ohio. Julian has 1,000,000 cubic yards of dirt to move in sub-grading 7.2 miles of the Ohio Turnpike.



LOADING IN MAHONING COUNTY. Two of D. W. Winkleman's five TD-24s complete fast cycles in spite of soggy going south of Youngstown. Roughly three-and-a-quarter million cubic yards will be moved on this contract.

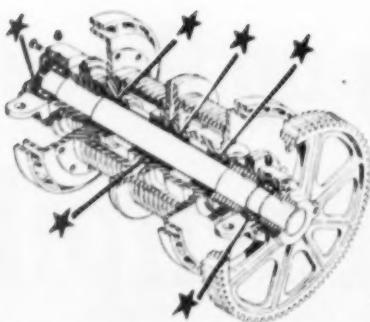


SPEEDS SOIL-STRIPPING FOR SMALLEY. Approximately 3,600,000 cubic yards of earth will be moved by D. R. Smalley and Sons, Celina, Ohio. One of their three TD-24s is used to pull a loader in the borrow pit near Milan, Ohio.



# INTERNATIONAL®

FOR EVERY MOVE IN EARTHMoving



STARS INDICATE LOCATION OF ANTI-FRICTION BEARINGS IN DRUMS AND PILLOW BLOCKS



LIMA Type 34, equipped with  $\frac{1}{4}$  yd. dipper, 18' boom, 17' dipper handle.

# LIMA'S shafts and drums roll on anti-friction bearings

As a result of twenty-five years' experience with anti-friction bearings, Lima design engineers know exactly where to put them to give you maximum benefits. This cut away view shows how Lima utilizes anti-friction bearings in the drums. X-ray vision would show you how Lima uses them throughout the main machinery on all shafts and other important parts.

This modern means of eliminating destructive friction benefits LIMA owners through faster operating speeds and lower upkeep. Anti-friction bearings also maintain perfect shaft alignment and insures smoother, easier clutch action.

## COMPARE! No other machine gives you as much as LIMA!

1. Bronze bushings in tread, idler and drive rollers are protected by piston-type dirt seal rings and retainers.
2. All gears, smaller parts and shafts which are subject to extra wear are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation to eliminate excess counterweight.
4. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
5. Big capacity drums and sheaves lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
7. Torque converter (optional) automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels ( $\frac{1}{4}$  yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

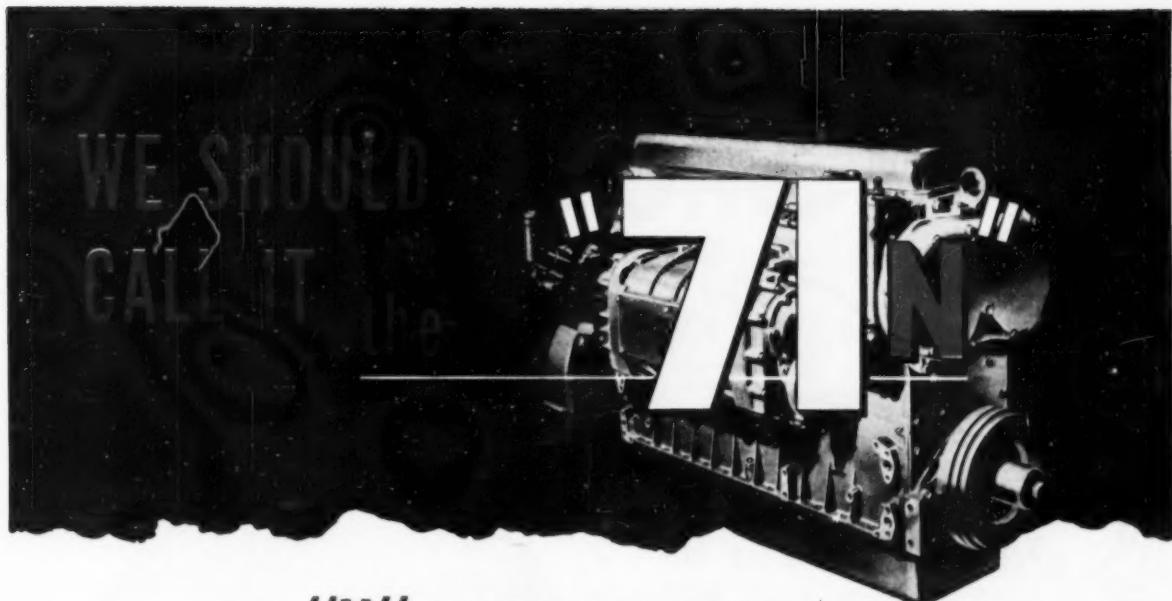
DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA**  
SHOVELS • CRANES  
DRAGLINES • PULLSHOVELS



Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION  
Construction Equipment Division  
LIMA, OHIO, U.S.A.



## "N" FOR NEW—New Where It Counts Most

You don't have to be an old-timer to remember when the first General Motors Series 71 Diesel was introduced. We called it the "71" in 1938 and we call it the "71" today.

But in 17 years these design improvements from top to bottom have given operators higher horsepower, lower fuel consumption and longer engine life. And now, a whole series of new improvements has made this fast-stepping, compact, 2-cycle Diesel better than ever.

from high cylinder temperature areas. Hard-chrome steel "Lite-Tite" piston rings resist wear; are tougher and more flexible and give many more hours of service.

And—best of all—in your next overhaul you can incorporate any or all of these new improvements in any GM Series 71 Diesel engine you're operating today. "The Inside Story" tells you how these new improvements can help cut your costs and speed your jobs. Mail the coupon today for your copy.

**NEW** **17 TO 1 COMPRESSION** gives better fuel economy, squeezing more power from every gallon of fuel.

**NEW** **"FIGURE 8" CYLINDER LINERS** give you a cleaner burning, more efficient engine. Air intake area is increased 32% for more complete fuel burning and better exhaust.

**NEW** **IMPROVEMENTS IN PISTON PIN, PIN RETAINER AND CAM FOLLOWER DESIGN** mean longer life, less maintenance cost. High-valve unit injectors last longer because the valve assembly is away

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General Motors Corporation  
Detroit 28, Michigan

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# Stick Your Neck Out!



**New Hercules Front Mounted  
Telescopic Hoist Gives You  
1000 lbs. Extra Legal Payload**

You can haul an extra half-ton of payload FREE on every trip by choosing the sensational new HERCULES Single Telescopic Hoist (Model 1210) for your heavy-duty dump truck bodies eleven to fifteen feet long.

This 20-ton capacity hoist pays for itself quickly because it weighs so much less . . . shifts more load to front axle . . . reduces driver cost per ton . . . and minimizes maintenance. Available for single or tandem axle straight trucks, Model 1210 mounts easily, no part extending below the truck frame.

For larger capacities, HERCULES builds Twin Telescopic Hoists with even greater payload-boosting advantages.

Act now to increase your profits. Write, wire or phone for complete information.



5357



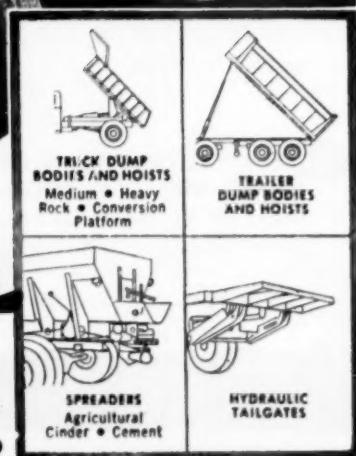
# Hercules

**buy from the line of strongest design**

HERCULES STEEL PRODUCTS CORPORATION • GALION, OHIO

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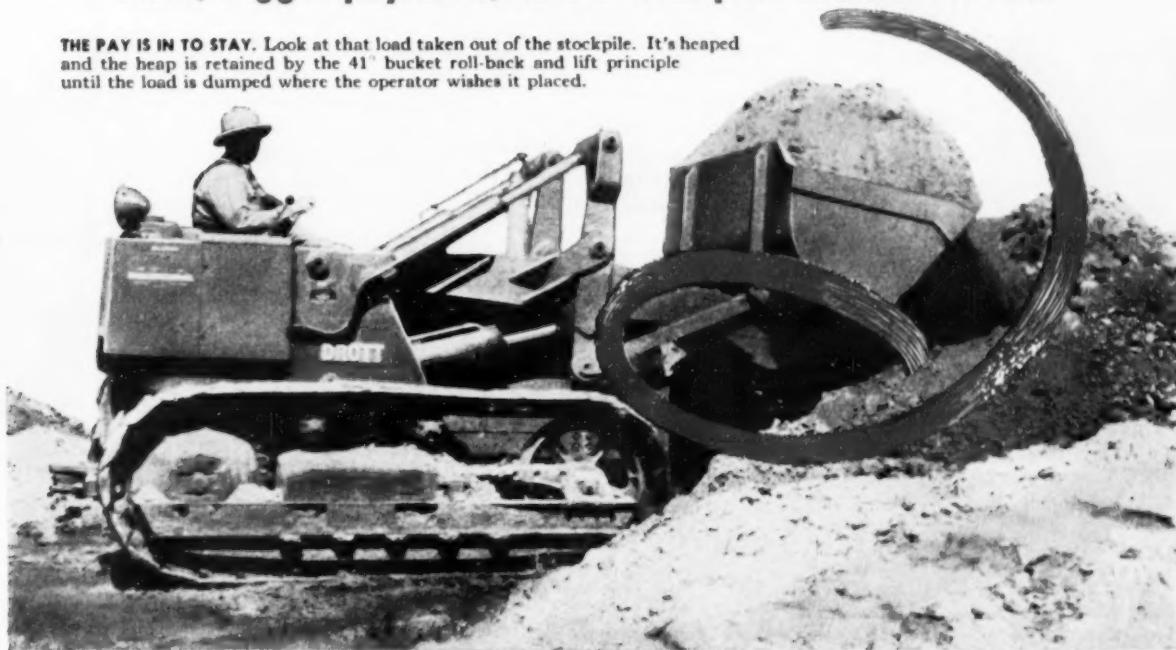
When writing advertisers please mention ROADS AND STREETS, October, 1954



# Get a LOAD of This!

Exclusive Drott Skid Shoes are the big reason why INTERNATIONAL crawlers with Drott Skid Shovels deliver 300% greater digging force, bigger payloads, faster transport than all others!

**THE PAY IS IN TO STAY.** Look at that load taken out of the stockpile. It's heaped and the heap is retained by the 41" bucket roll-back and lift principle until the load is dumped where the operator wishes it placed.



Big news in the front-end loader industry today is the amazing performance of the new leader in loaders—INTERNATIONAL crawler equipped with Drott Skid Shovels.

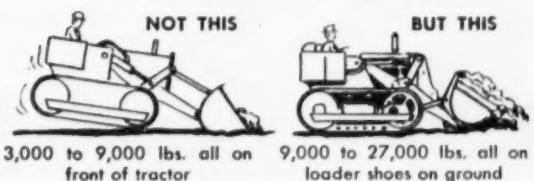
Drott Skid Loaders have exclusive Skid Shoes that permit use of the ancient lever principle to supply 300% greater break-out force than all other shovels. These same Skid Shoes transmit loading force into the ground and let the units transport heaped loads at ground level in third gear—not first—to speed every loading cycle and eliminate carrying strain.

The Hydro-Spring is still another Drott exclusive—absorbing 70% of the shocks normally encountered in front-end loaders to extend equipment life and make operating far easier.

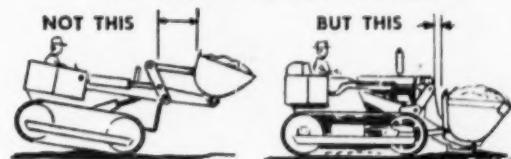
Skid Shovels come in four sizes— $\frac{7}{8}$ ,  $1\frac{1}{4}$ , 2 and 3 cu. yd. buckets for the INTERNATIONAL TD-6, TD-9, TD-14A and TD-18A. You can get an eye-opening demonstration of the model suited to your needs by simply calling your INTERNATIONAL Industrial Power Distributor today.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS  
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

#### PRY-ACTION BREAK-OUT



#### SKID SHOE TRANSPORTATION



**INTERNATIONAL  
DROTT**

*Pave*

**with SMOOTH, POWERFUL TRACTION  
—with almost no upkeep!**

YOU DON'T NEED CRAWLERS FOR TRACTION! Here is a

Blaw-Knox Bituminous Paver handling 16-ton trucks on a 12%  
grade. The B-K took the big loads up the grades with ease—without an  
extra peep from the engine—with a chatter in machine or screed.  
The Blaw-Knox is on wheels!

Wheels are simple. They require practically no upkeep. They eliminate  
the 500 to 700 parts that make up most crawlers. They assure more accurate  
steering and eliminate the oversteering and correction characteristic of  
crawler travel. They reduce return travel time to start new parallel courses  
and cut down on truck "standing time." Pneumatic tires absorb excess vi-  
bration that lowers the quality of screed performance and the resulting  
surface. Operator fatigue is reduced and machine life prolonged.

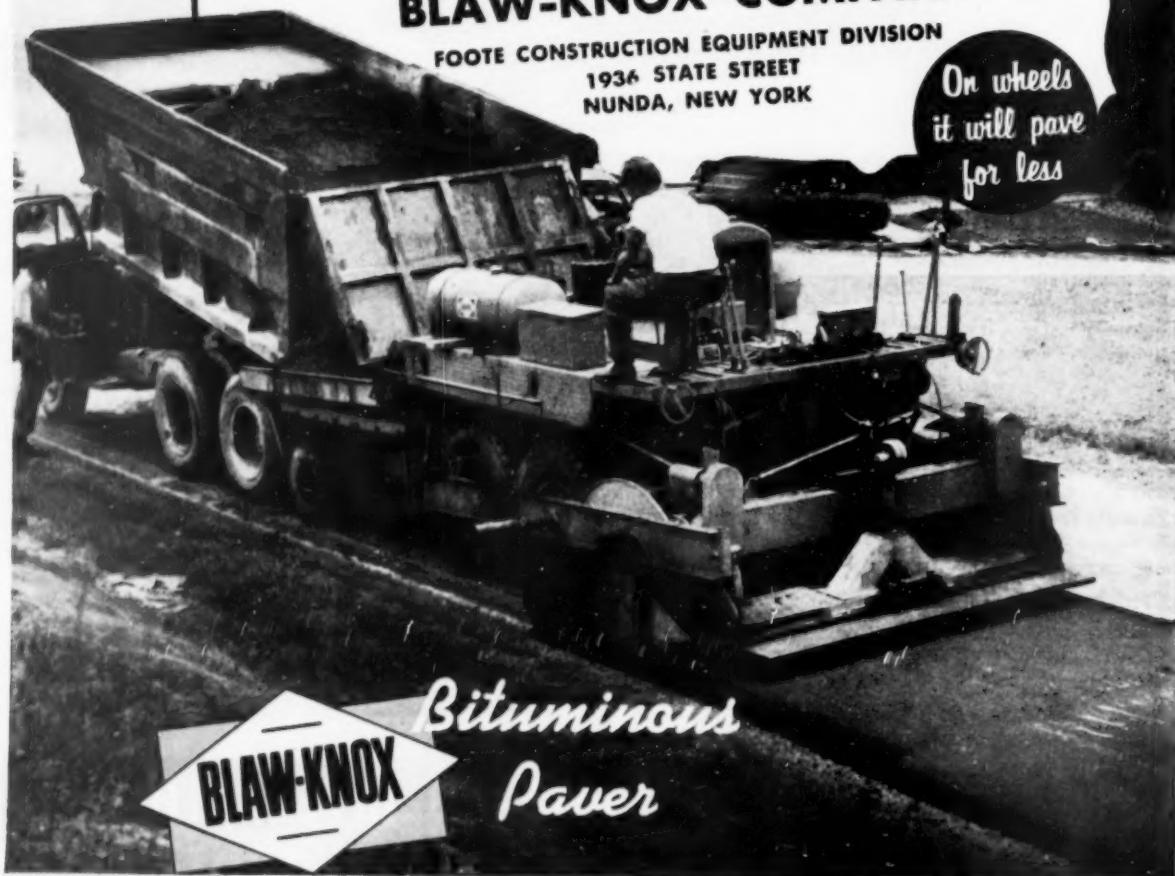
Wheel travel makes possible a better black top job at higher speed  
and lower cost!

Get the whole story about the Blaw-Knox Bituminous Paver before  
you buy. Ask for the two folders—"The Greentree Story" and "The  
Garden State Parkway Story."

## BLAW-KNOX COMPANY

FOOTE CONSTRUCTION EQUIPMENT DIVISION  
1936 STATE STREET  
NUNDA, NEW YORK

On wheels  
it will pave  
for less



**Loader  
with a  
boardinghouse  
reach . . .**

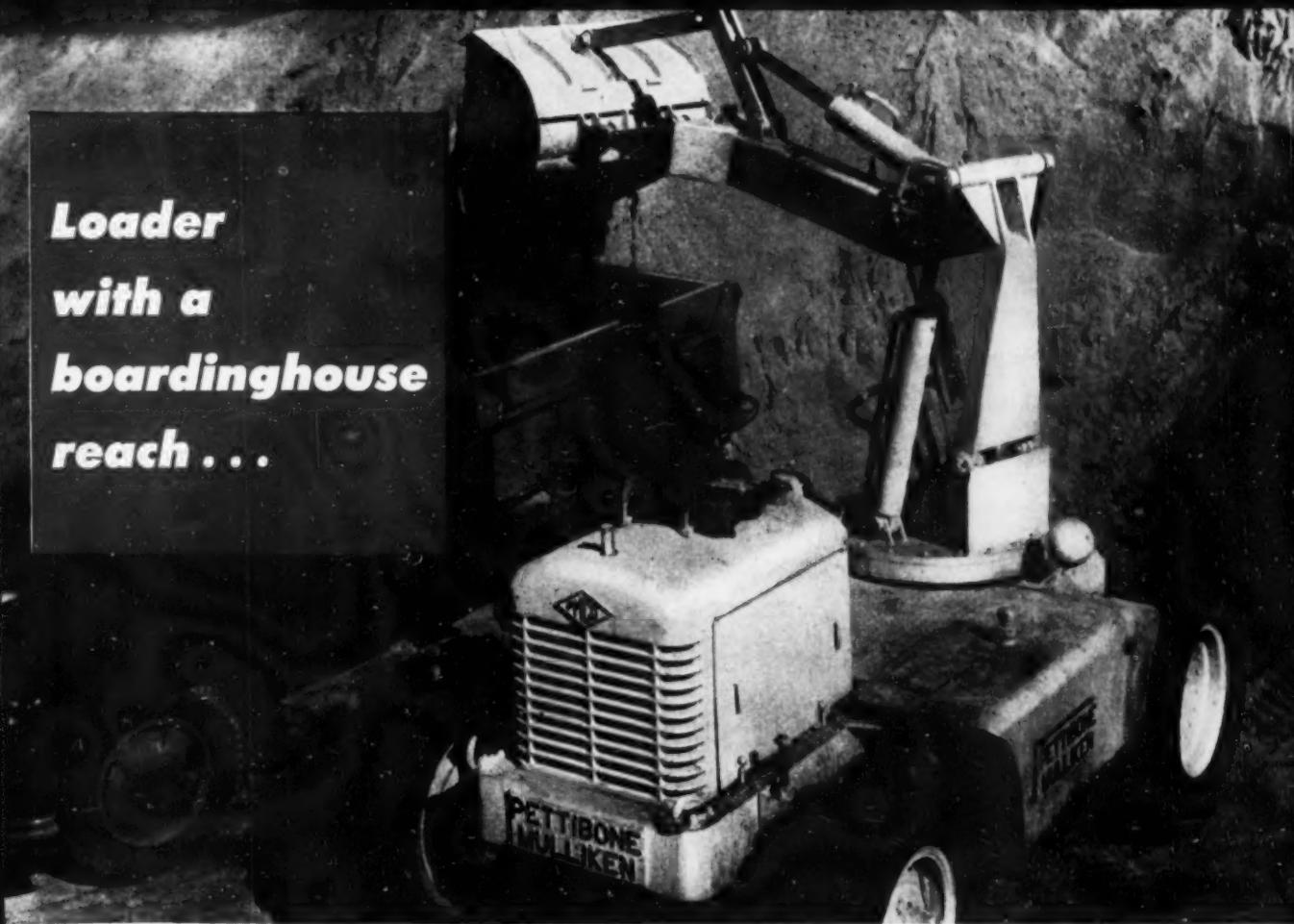


PHOTO COURTESY PETTIBONE MULLIKEN CORPORATION, CHICAGO, ILLINOIS

## **CHRYSLER Industrial Engine and torque converter assure faster handling of tougher jobs**

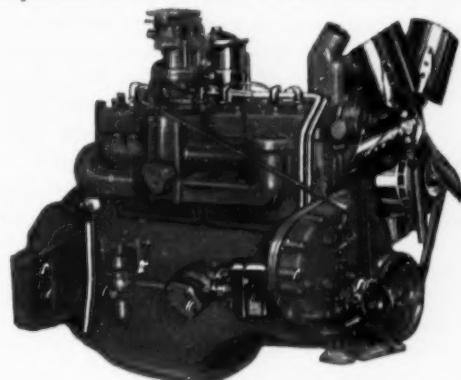
This versatile, highly maneuverable loader goes after work like a stevedore after "seconds." Boom swings through 180°, loads faster, in less space, to the left or right without moving from its short, single working line. Cuts loading time up to 25%. Bucket, fork, tote hook and backfiller blade attachments are interchangeable.

Torque Converter provides extra power for tough going, faster acceleration *without* necessity of shifting gears or declutching. Furthermore, the Torque Converter eliminates shock loads to the power train . . . thus reduces maintenance.

Pettibone Mulliken Speed Swing Loaders come in two sizes . . .  $\frac{3}{4}$  cubic yard and 1 cubic yard. Both sizes can be supplied with four-wheel drive (like the unit pictured), and four-wheel steer. Chrysler 230 cubic inches displacement Model 30 Industrial Engine drives the  $\frac{3}{4}$  cubic yard unit, and the 265 cubic inches displacement Model Ind. 16 drives the 1 cubic yard unit. Chrysler Torque Converter connects engine with four-speed transmission, transmits power to boom.

In considering power for your equipment, remember Chrysler Power is not expensive. Production-line methods

adapted to specialized industrial engine building provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine dealer or write: Dept. \*\*\*\*  
*Industrial Engine Division, Chrysler Corporation, Trenton, Mich.*



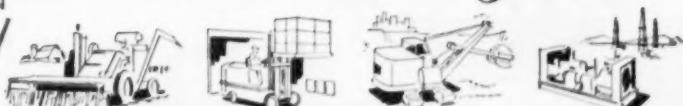
## **CHRYSLER Industrial Engines**

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER



WITH A PEDIGREE



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**WHITE TANDEMS** are really on the move... wherever building materials need to be moved!

Their rugged power and ability to take it speeds hauling, grading and excavating. They last longer on the tough jobs, the big loads!

But the big extra which is exclusively White is the payload earning power...the extra profit because of White Specialized Design.

Tailored to exact working conditions, White Tandems get *more* work done...in *less* time...at *lower* cost.

You are losing money by the truckload if you delay getting facts from your White Representative.

**Doubles Payload by  
Switching to WHITE  
Tandem Dump Units**

...**DE VINCENTIS CONSTRUCTION CO.  
Philadelphia, Pa.**

This White Model WC-2264 Tandem has nine cu. yd. dump body. It's light enough to carry 13-tons of building materials within legal limits...rugged enough for the tough "off-highway work"...powerful enough to improve your schedule time.



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*For More Than 50 Years The Greatest Name In Trucks*

# HOW TO CLEAR SNOW

at a saving!



It's Easy with the low cost **FORD** Tractor



#### CLEAR LARGE AREAS QUICKLY

Dearborn Blade Snow Plow windrows snow to right or left in a hurry. Six foot blade lifts and lowers hydraulically...attaches quickly to Dearborn Industrial Loader. End plates and skid shoes are available for special jobs.

More and more economy-minded governmental officials are finding the Ford Tractor a money-saving way to solve snow removal problems. Here are two important reasons why:

**TAKES WINTER WEATHER IN STRIDE**—The Ford Tractor and Dearborn Industrial Loader with Snow Bucket will load, lift and dump over  $\frac{1}{2}$  yard of snow at a "bite". And it does all this hydraulically at the nudge of a lever. It's highly maneuverable for work on crowded parking lots, busy streets and sidewalks. Highly versatile, too . . . rear mounted blade can be used to windrow snow, or to clean curbsides even while front mounted loader is in operation.

**KEEPS BUSY ALL YEAR LONG**—Snow removal is just one of the many jobs that the low cost Ford Tractor does economically. During the rest of the year you can use it for sweeping, grading, digging, loading and mowing. You can use it to maintain parks and roadsides, as well as roads and streets.

Before your snow problems pile up this winter, take a look at the versatile Ford Tractor. Find out how it can handle snow right now—saves you money on dozens of other jobs all year long. See your nearby Ford Tractor and Equipment Dealer or write to the address below.

**TRACTOR AND IMPLEMENT DIVISION, FORD MOTOR COMPANY**  
Birmingham, Michigan



# PROTECTION EFFICIENCY

for your  
CITY

*Shuredry*

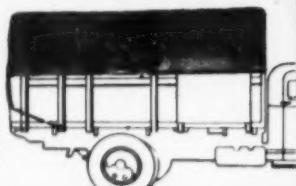
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Cut water and smoke damage with SHUREDRY Green-Bak Salvage Covers — they're pressure impregnated by an exclusive Fulton dry-treatment process. All seams are waterproof. SHUREDRY Covers are light, pliable and easy to handle. Specify SHUREDRY — your Fire Equipment Dealer has them.



FULTON COVERS  
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Fulton makes a complete line of top quality Tarpaulins and Truck covers in any size you need.

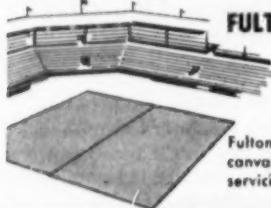


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CURING MATS for  
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Fulco Mats produce a more uniform paving job, minimize the possibility of cracks and do in 72 hours what took about 10 days under the wet-burlap-wet-earth method. Fulco Mats can be used 50 to 75 times. They're economical.

FULTON COVERS AND TARPS  
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Fulton's special treatment of the heavy canvas duck assures long, economical service.



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information and prices.

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# FRINK V-TYPE

## SNO-PLOWS WON'T WEDGE IN HEAVY SNOW



No matter how hard they hit or how deep the snow the Frink will not stick

The rear of the plow is suspended from the front of the truck and the weight is transmitted to the truck springs through the Heel Adjusting Chains.

When bucking deep snow the springs deflect more than normally, and as soon as the plow stops, the front of the truck springs up, carrying the heel of the plow with it. The truck then resettles into normal position, freeing the plow from the accumulated snow—even if it is wet.

FRINK V-TYPE SNO-PLOWS can be attached to any Standard Frink Push Frame Assembly.

For further information on this Sno-Plow,  
write for catalog to nearest address, Box RS 5410

FRINK  
SNO-PLOWS

FRINK SNO-PLOWS, INC., CLAYTON, NEW YORK  
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FRINK SNO-PLOWS of CANADA, LTD., TORONTO, ONT.

# Motorists: here's proof...

Gulf's cleaner-burning, super-refined gasoline solves today's No. 1 engine problem!



## Laboratory tests promised...

... these immediate and lasting benefits from this new, super-refined fuel:

**More complete** engine protection than from the so-called "miracle-additive" gasolines. Why? Because Gulf refines *out* the "dirty-burning tail-end" of gasoline (the No. 1 troublemaker in high-compression engines)—and then treats this new Super-Refined NO-NOX to give it a *complete range of protective properties*. It protects every part it touches against carbon, rust, gum.

**Extra gas mileage** in all your everyday, short-trip, stop-and-go driving.

**No knock, no pre-ignition.** Why? Because the anti-knock power of new Gulf NO-NOX has been stepped up to an all-time high.

**Stall-proof smoothness.** Instant starts, too—and fast, fuel-saving warm-up.

That's why new Super-Refined Gulf NO-NOX gives your engine more power-with-protection than you've ever known.



## Road tests proved...

These cars, powered by New Gulf No-Nox, actually performed better than new... after 15,000 miles!

True! After 15,000 miles per car—covering all conditions of city and country driving—Gulf test cars showed these results:

- Higher-than-new horsepower!
- Better-than-new on gasoline mileage!
- And not a single trace of carbon knock or pre-ignition at any time—even on the steepest mountain grades!



COMPLETELY NEW! SUPER-REFINED

# New Gulf No-Nox

THE HIGH-EFFICIENCY GASOLINE



# We torture truck axles to

*in the new Timken-Detroit indoor proving ground  
...and only Timken has it!*

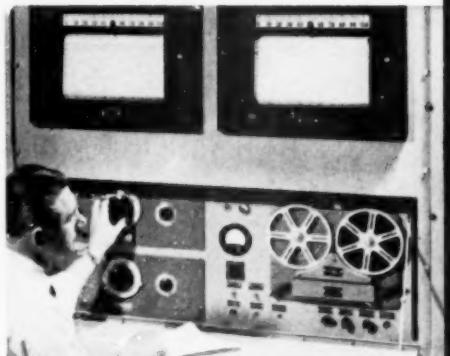
**We shock-load, abuse, and torture them. Match every conceivable hauling condition. Then add a few brutal tricks of our own!**

**Why?** So you'll know in advance, and *for sure*, that a Timken-Detroit axle can take the punishment it was designed for. More rugged, grueling punishment than any other axle made!

To prove it, we capsule a multi-thousand acre proving ground into one room. Here our engineers can put 50 years of experience in building axles for trucks,

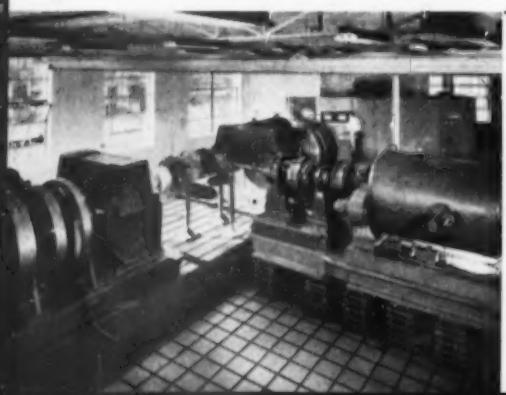
buses and trailers to work — subjecting axles and gearing *indoors*, to any *outdoor* operating condition.

Such exacting research pays off for you in: longer axle life; less maintenance, repairs and downtime; reduced operating expenses. This is why Timken-Detroit axles are preferred by manufacturers and operators everywhere.



#### How TDA proves axle quality in this "Torture Chamber"

We pick one of our axles at random . . . then duplicate a hauling condition, hour after hour, day after day . . . simulating half a million miles of the toughest driving situations in just a few days. Or "invent" a test like going uphill with a full load from California to New York nonstop. There is no other axle testing like it in the world!



**This is our "truck driver."** He works in our "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!

# How Timken-Detroit 2-speed axles with man-size gears, operate in any gear ratio...indefinitely, without overheating!

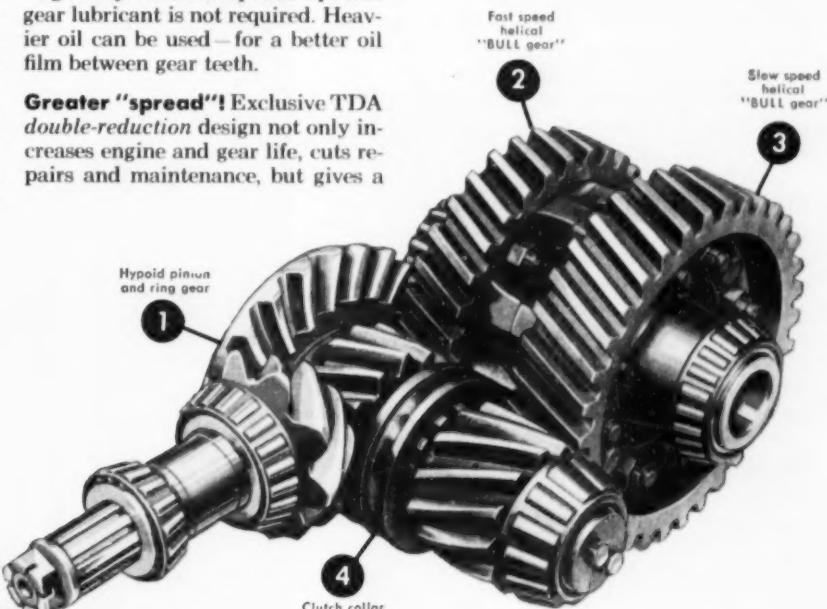
**The secret?** A husky hypoid ring gear and bigger, stronger pinion set (No. 1 in illustration) provides the first step of the total gear reduction for both fast and slow ratios. Two large, heavy-duty helical gear sets provide the second step. Both sets are of equal size and capacity—but one set (No. 2) is for fast speed—the other (No. 3) is for slow speed. The clutch collar (No. 4) moves to left or right to engage one "BULL gear" or the other.

**The result:** Complete elimination of small, complicated parts and midget-size gears! Larger hypoid-helical design gives more teeth in contact—

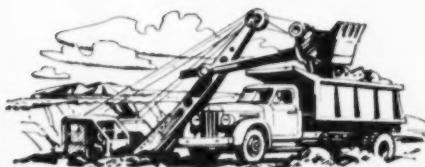
reducing load per unit of contact area—for more positive, quiet operation. Bearings are larger. There's longer motor and truck life because wear on driving parts is less. When you divide the total gear reduction, you double its life expectancy. And the set of "BULL gears" not in use, always idles at greatly reduced speed. Special gear lubricant is not required. Heavier oil can be used—for a better oil film between gear teeth.

**Greater "spread"!** Exclusive TDA double-reduction design not only increases engine and gear life, cuts repairs and maintenance, but gives a

vastly greater gear ratio "spread" for all jobs requiring any range of speed or power. A fast gear ratio for light loads everywhere—full loads on the level. Slow speed ratio for full loads on hills—for better pulling in "soft going."



# death



## TIMKEN *Detroit* AXLES

TIMKEN-DETROIT AXLE DIVISION  
ROCKWELL SPRING AND AXLE COMPANY  
DETROIT 32, MICHIGAN



**"TORTURE-TESTED"**  
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF  
AXLES FOR TRUCKS, BUSES AND TRAILERS

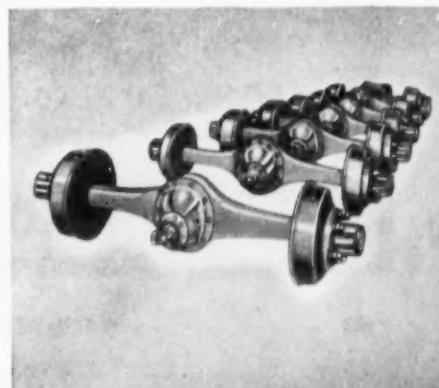
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**7 basic axle capacities!** Only TDA, world's largest manufacturers of truck, bus and trailer axles offers a family of 7 basic axle capacities, each with interchangeable final drives: single-speed, single-reduction, single-speed double-reduction, and two-speed double-reduction, using the same axle shafts and housing. Nowhere is there such a selection to fit all special needs.

**Hot-forged steel housings!** Pound for pound the strongest, most rigid ever built! Rectangular TDA housing shape gives maximum strength, uniform stress distribution, minimum weight. Ask about the TDA "Life of Vehicle" guarantee.



# 21-SECOND batch time

speeds airport and highway paving . . .

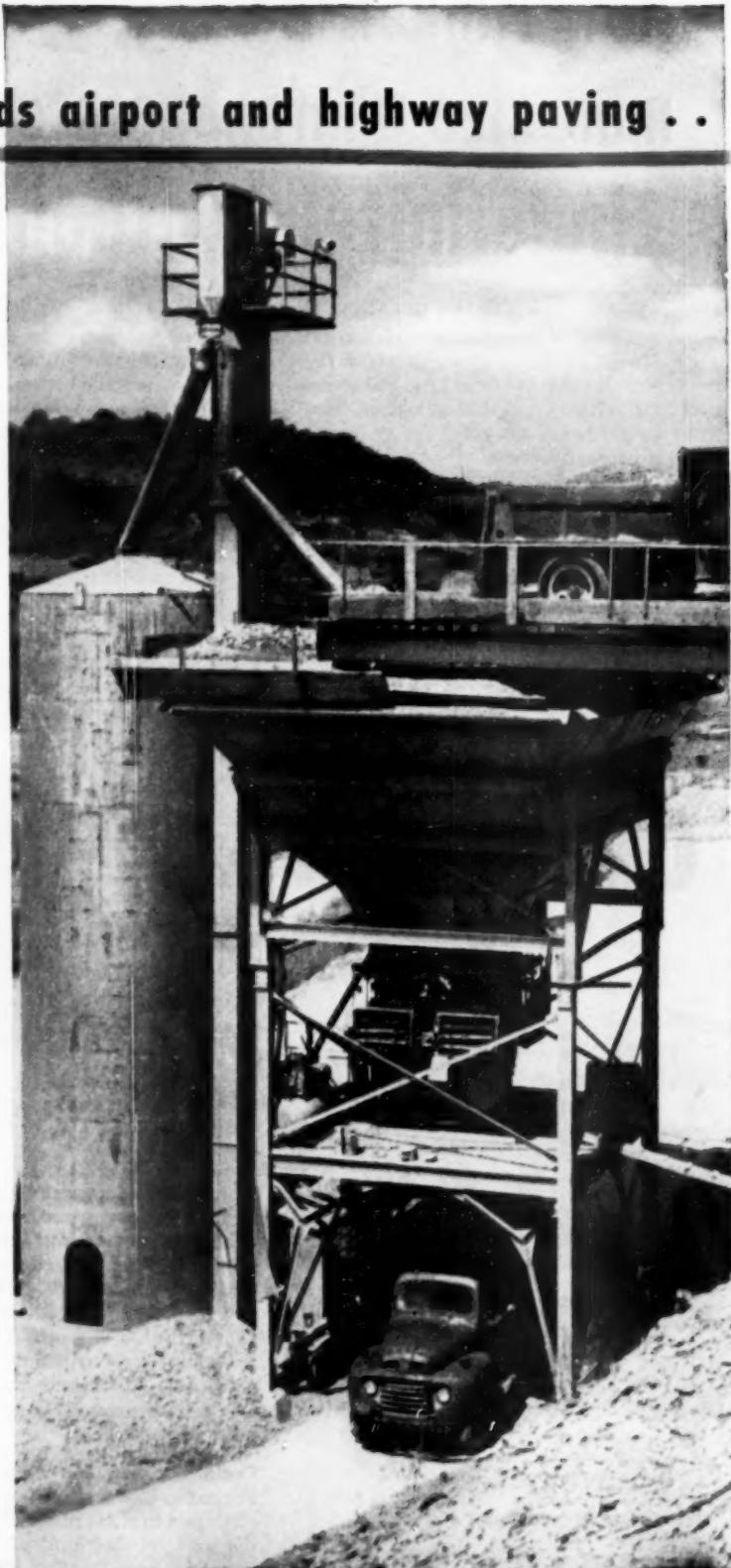
Johnson Automatic Batch Plants, like the one shown here, accurately weigh out aggregates and cement ahead of heaviest paving schedules on highways, airports, and other large-volume concrete jobs. For example:

**Keeps two 34-E pavers busy . . .** One plant, with one batcher operator, easily supplies enough materials to keep two 34-E pavers busy full time. A 1½-cu. yd. batch is weighed up, and discharged into truck, in as little as 21 seconds. One-stop charging of batch trucks speeds production. (Plant also can be arranged for two-stop charging.)

**Automatic control** maintains high plant output all day . . . assures pin-point weighing accuracy of every batch. A separate, fully-automatic weigh-batcher is used for each of the aggregates, and for the cement. All materials weigh up at the same time for greatest speed. These single-material Johnson batchers operate on electro-pneumatic control . . . fill valves and discharge gates are automatic air-ram operated.

**Multiple batch selections . . .** For road-builder's use, dial scale with electric cut-off switch is usually used. When more than one batch size is required, single material batchers can be equipped with mix selector for 12 different mixes . . . all controlled from central operator's station. (Each of the single-material aggregate batchers can be equipped with a moisture compensating lever which automatically gives a dry weight of material being weighed.) Up to 120 mix selections are available on large Johnson batch plants for dams, and commercial ready-mix installations.

Investigate the possibilities of increasing concrete production on your operations with one of these Johnson Automatic Batch Plants. In many instances this equipment can be added to an existing plant. For complete details, contact your Johnson distributor, or write to us.



**C. S. JOHNSON COMPANY**  
CHAMPAIGN, ILL.

(Koehring Subsidiary)



**JOHNSON automatic BATCH PLANTS**

G4434

## ... one-man operation



14½-ft.-per-min.

### Parsons Trenchmobile

Rubber-tired Trenchmobile drives job-to-job at 12.6 m.p.h. . . . digs 8 to 16 in. wide, 5 ft. deep, up to 14½ ft. per min. Sloping ladder boom makes vertical set-ins, undercuts sidewalks, curbs, old mains. Other features: hinged crumber, "Tap-In" digging teeth, reversible conveyor, optional backfill blade. Also ask your Parsons distributor about the 2 wheel-type and 3 ladder-type Trenchliners® . . . all full crawler mounted.

**PARSONS • Newton, Iowa**  
(Koehring Subsidiary)

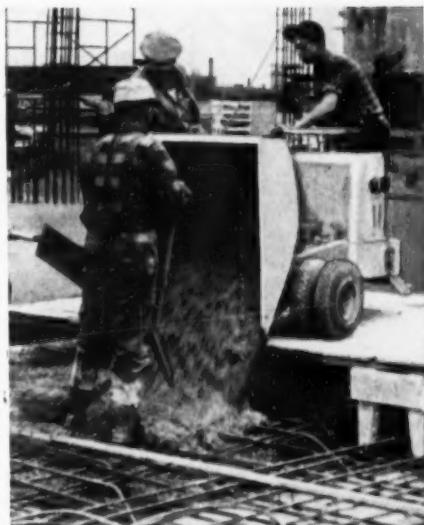


### Kwik-Mix Moto-Bug®

#### has ¾-ton capacity

Moto-Bug power wheelbarrow hauls 10 cu. ft. (or 1500 lbs.) of any bulk materials. Has instant gravity-dump, with snub-line control. Climbs 20% ramps or grades. There's full power forward and reverse . . . and safe, automatic brake control. Hopper is interchangeable with 1500-lb. platform, or ½-ton (5-ft.) fork lift. Send for Moto-Bug bulletin. Also check Kwik-Mix line of concrete mixers, bituminous and plaster-mortar mixers.

**KWIK-MIX • Milwaukee, Wis.**  
(Koehring Subsidiary)



### Save turn-time with

#### Koehring Dumptor®

Fast-shuttling Koehring Dumptor® eliminates slow turns at loader, on narrow haul roads, and at the dumping location. With constant-mesh transmission, Dumptor travels same speeds forward and reverse . . . gets its load, drives to fill, dumps and returns to loading unit without turning. Eliminating only 2 turns saves ½ minute on every cycle. Instant gravity dump cuts another 15 to 25 seconds off haul cycles with heavy-duty Dumptors.

**KOEHRING Company**  
Milwaukee 16, Wis.



Main units in this Johnson Automatic Batch Plant consist of: 150-cu. yd. square bin, with 3 aggregate compartments, and a 150-bbl. central cement compartment. Three 2000-lb. automatic single-material aggregate batchers . . . one 1000-lb. automatic cement batcher. Truck-receiving hopper, bucket elevator and 757-bbl. aerated silo for cement. Hillside ramp permits convenient truck delivery of aggregates to top of bin.

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ELEVATORS • CHARGERS  
CLAM SHELL, CONCRETE • BUCKETS

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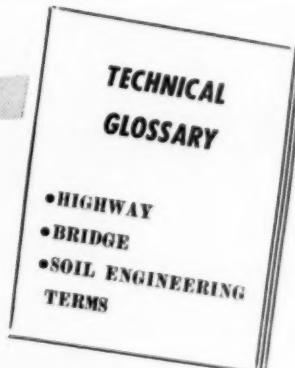


**Here is a book you will want:**

- ★ 20,000 English-Spanish
- ★ 17,000 Spanish-English  
Technical Terms

- ★ Prepared by U. S. Bureau of  
Public Roads

- ★ Preparation Cost in Excess of \$45,000



TECHNICAL GLOSSARY is a much needed work for use in translating English technical material into Spanish, or Spanish technical material into English, in order to convey the exact same idea and meaning to the reader of either language.

**T**HIS BOOK has been in process of preparation for a period of fifteen years. When it comes off the press the preparation cost will be in excess of \$45,000.

The need of a specific glossary or dictionary of terms of this type has long been felt. After several International conferences between representatives of the U. S. Bureau of Public Roads and Latin American engineers, a decision was reached to prepare such a glossary. To further extend its usefulness, soil stabilization and associated laboratory work was included.

The manuscript for this book of over 35,000 terms was over 15 years in preparation under E. W. James, then Chief, Inter-American Regional Office, U. S. Bureau of Public Roads, working

with the Library of Congress of the United States. It has been approved by a committee of five bilingual engineers of the Mexican government under the chairmanship of Sr. Ing. J. Fco. Rodríguez Cabo. It was then submitted to and approved by the "Academia Mexicana Correspondiente de la Academia Real Española" under the chairmanship of Sr. Don Martín Luis Guzmán, distinguished author, editor and publicist, also publisher of "El Tiempo."

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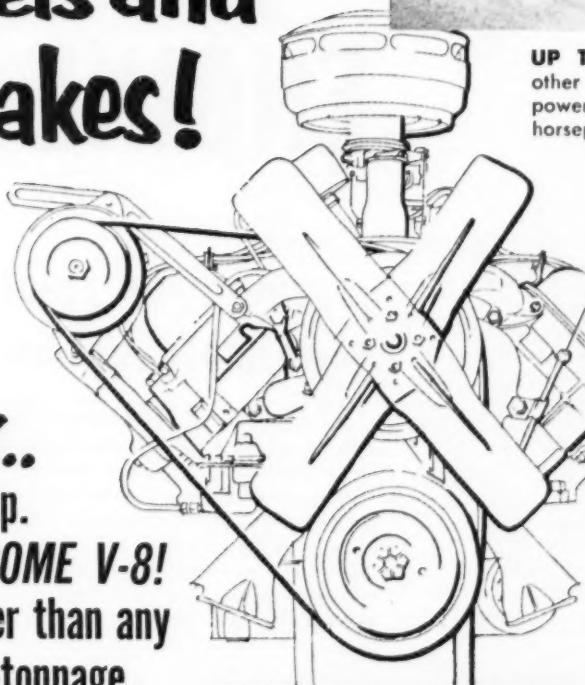
CHICAGO 10, ILLINOIS



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**Now...**  
 new 145-hp.  
**POWER-DOME V-8!**  
 More power than any  
 other low-tonnage  
 truck engine!

Test for yourself the flashing acceleration, the big power reserve of this new 145-hp. Power-Dome V-8 . . . the ultra-modern truck engine that gives Dodge pick-ups and stakes *more power than any low-tonnage truck!* Ask your dependable Dodge truck dealer to show you a new Power-Dome V-8 or a 110-hp. thrifty six!



**UP TO 39.4% MORE POWER** than other  $\frac{1}{2}$ -,  $\frac{3}{4}$ -, and 1-ton trucks. It's low-cost power, too! Dodge V-8 pick-ups offer most horsepower for your truck dollar.

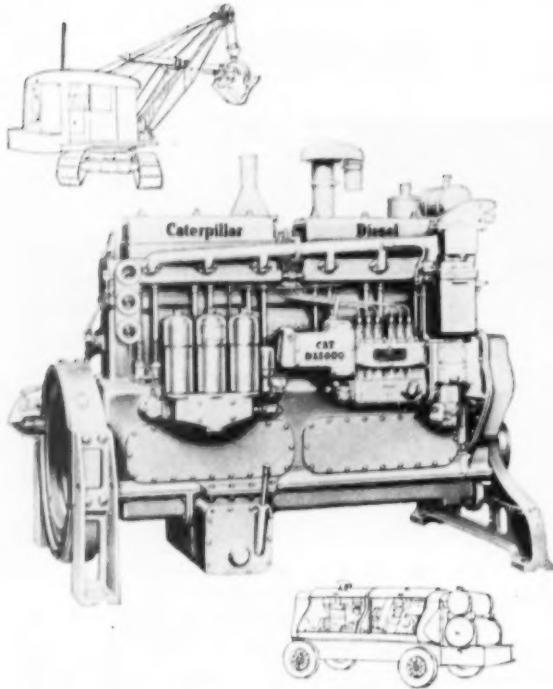


**OFFERS MORE MILES PER GALLON** on regular gas—most hp. per cu. in. displacement of any popular truck engine—prove new Power-Dome V-8's economy.

**"NEW-TRUCK" POWER LASTS LONGER:** Power-Dome design . . . proved in higher tonnage models . . . means fewer power-stealing "hot spots" in combustion chambers.

**More proof that Dodge trucks offer a better deal for the man at the wheel!**

# DODGE "Job-Rated" TRUCKS



#### CATERPILLAR ADVANCED DESIGN FEATURES IN THE NEW D13000

While retaining such time-proved features as aluminum alloy main and connecting rod bearings, "Hi-Electro" hardened and Superfinished bearing surfaces, exclusive Caterpillar fuel injection system, ability to use low-cost No. 2 furnace oil without fouling, etc., the new D13000 incorporates many new features, among them:

**NEW Valves, Inserts, Rotators**—new components, standard in the breathing system, combine increased breathing ability with longer valve life—make possible additional horsepower output and lower maintenance costs.

**NEW Vibration Damper**—sturdy, metal-enclosed, fastened directly to front of crankshaft. Keeps unit vibration-free at higher speeds. Optional in installations where engine speed is kept below 1000 r.p.m.

**NEW Camshaft**—improved high lift cam profiles give smooth valve seating and increased breathing ability. This increased capacity, also made possible by new oil-bath air cleaner and larger intake and exhaust manifolds, insures low exhaust temperatures and adequate reserve power.

**NEW Water Pump**—larger, with a greatly increased capacity to answer cooling needs of this modern, high-powered diesel.

**NEW Pistons**—oil-cooled, made of high-strength, light-weight aluminum alloy with stainless-steel heat plugs in the high-temperature zone and cast-in iron bands for the top ring groove to give best service at lowest final cost.

**NEW Oil Pump**—features not just one, but two pressure controls to assure correct lubrication for all moving parts from the first turn of the crankshaft.

*For complete details, specifications, attachments, etc., see your nearby Caterpillar Dealer*

**Announcing the**

# NEW 190-HP CAT<sup>\*</sup> D13000 ENGINE

**... yours for greater  
power, production, profits!**

For years, working in all kinds of construction equipment, conditions and jobs, the Caterpillar D13000 Engine has proved itself a big money-maker for power users. Now, here's a new D13000, designed and built to bring you even greater power, production and profits!

In the new D13000, you get 21% more brake horsepower. Its governed speed, raised to 1200 r.p.m., provides greater versatility and productive capacity. While keeping outstanding, time-tested parts, it adds advanced design features to set new standards of stamina, dependability, economy and long life. And its wide variety of matched accessories and attachments makes it readily adaptable for any need.

For jobs requiring power in the 145 (continuous) to 190 (intermittent) horsepower range, your best buy is this rugged new Cat D13000 Engine. Leading manufacturers of excavators, crushers, compressors and other heavy-duty machinery can furnish it in their equipment. Get the *complete* facts about it today from your nearby Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

\*Both Cat and Caterpillar are registered trademarks — ®

D13000—  
A NEW STANDARD  
OF DIESEL POWER

# Lime Applied from Tankers

## ON TEXAS BASE STABILIZATION PROJECT

*Farm-to-market road reconstructed under triaxial design principles, using job procedures found effective on hundreds of miles of roads in Texas.*

APPLICATION of hydrated lime in slurry form by tanker and spray bar, instead of by the familiar dry method, is an innovation used successfully on a farm-market road in Tarrant County, Texas.

The project which was completed in June, 1954, consists of 6.3 miles of Texas FM 157 extending north from Arlington, Texas, to State Highway 183. This road in the Dallas-Fort Worth area has had a traffic surge due to the proximity of a large aircraft factory and several other industries. While still classed as a farm-to-market state road, it was redesigned to a higher standard than ordinarily used for such roads in Texas. The purpose of the stabilization was to bring the base up to Texas Class I specifications, with respect to triaxial

test results. This design is in effect for a 12,000 lb. wheel load, compared with 16,000 lb. for state primary roads.

The existing highway was an ordinary 2-lane road with light surfacing, extending across a stream bottom area of black soil and also through an adjacent hilly area having better soils and drainage. The decision was made to completely re-cross-section the road and, through minor grading, give it a definitely improved profile.

The resultant design included a compacted grade, a variable subbase and base, and a double bituminous surface treatment, as shown on the accompanying typical cross-sections. Pipe and box culverts were extended or rebuilt. No attempt was made to

salvage any of the old road bed.

For the most part the design consists of 8 inches of select material and 9 inches of pit run gravel, the upper 5 inches of which was lime stabilized. Elsewhere this total thickness of 17 inches was reduced to 12 inches of pit run material, with the upper 5 inches stabilized.

Lime for the project consisted of 1,366 tons of commercial hydrated lime from Texas Lime Company's plant at Cleburne. Lime was applied at the rate of 3 per cent by weight, and sufficient total application per square yard was supplied to give this percentage for a 5-inch mixing depth.

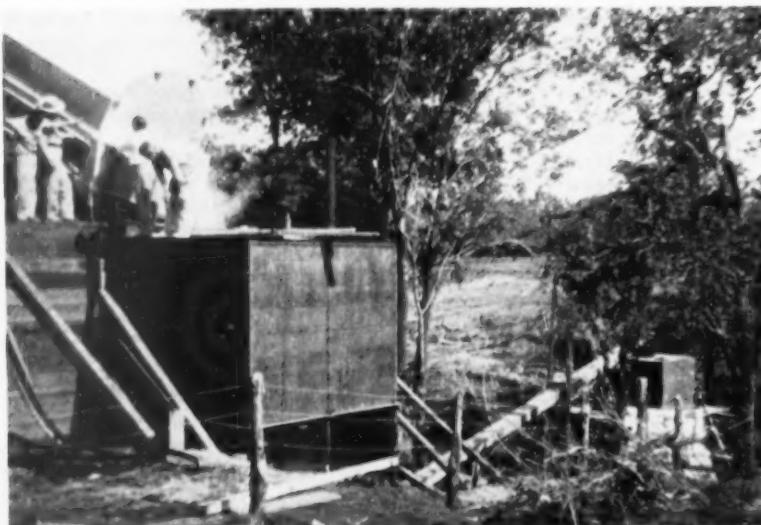
The project was awarded to Cage Brothers, of San Antonio, at \$298,636. The grading was done with the usual scraper pans, motor scraper units and motor graders. In order to maintain traffic through the job — in the absence of a nearby detour road — the contractor established a temporary 18-ft. grade through the work,



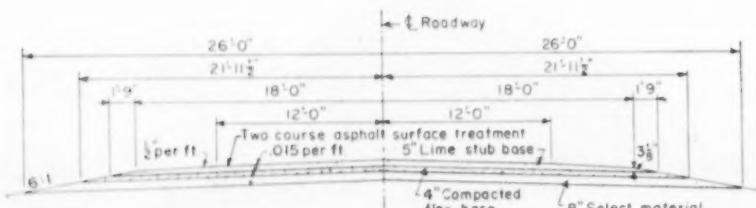
● Applying "lime water" at high speed from a sprinkler truck.



● Lime was introduced into the sprinklers at this central station.



● Feeding lime into the gravity tank, for introduction into the sprinkler below.



● Cross-section of Texas farm-to-market road involving lime stabilization.

along one side of the right of way. The grading was completed full width, while thus maintaining traffic, and then the select material subbase and the unstabilized portion of the gravel course were constructed half-

width clear through the project. Traffic was thrown onto this side, and the other half completed up to the level of lime stabilization. A combination of heavy tamping rollers and pneumatic tire rollers were used to pulverize and

compact the select and pit run material, with motor graders spreading from windrows, skimming and leveling as compaction progressed.

#### Feature Holds Traffic

A job feature was the application of HVMS grade asphalt emulsion on the compacted base course in a 5 to 7 per cent tanker solution, as a means of holding traffic until the work was completed. This served as a dust palliative as well as a temporary binder. Emulsion was paid for by the gallon actually used, and water by the 1,000 gal., as ordered by the engineer. This treatment held traffic in one instance as long as three weeks, in the absence of eroding rain.

The contractor's lime slurry was prepared as follows: Hydrated lime was delivered in 30,000 lb. loads by semi-trailer bulk carriers to a centralized plant located adjacent to a creek running through the job. The lime was dumped into a 50-yd. steel storage bin, located on a hillside. A 9-in. covered screw conveyor moved the lime from the storage bin to an elevated 7.25-yd. steel proportioning bin. The contractor's 2000-gal. tank trucks were loaded by backing a tanker under the raised proportioning bin and feeding the lime into the tank along with water pumped from the stream. The mixture was agitated thoroughly by blowing air through it, supplied by a 600 and a 315 cfm compressor. A typical tank load of slurry contained 6000 lb. of hydrated lime and approximately 1500 gal. of water. Fifteen to twenty minutes were required to prepare each batch.

The lime application to the road and mixing placed full width on the grade, usually in work sections about 2,300 ft. long. The slurry was added in 2 or 3 passes, the total application being calculated to give the desired spread of 100 pounds of lime per yard of gravel. Between tanker applications the lift was worked with motor graders to secure a thorough and uniform mixture of lime, water and gravel. No trouble was experienced with lime separating from the slurry and clogging the sprinkler openings on the tank trucks.

#### Pneumatic Tire Rolling

Rolling was done with pneumatic tire rollers, followed by a final rolling with a 10-ton steel wheel roller. The protective emulsion was applied immediately. Traffic was allowed through the work in its various stages.

Whereas the moisture present in the ordinary dry-lime procedure usually runs 80 gal. per cu. yd. of material, the contractor often held the



● Steps in shaping the grade and inter-mixing the lime slurry. (Photos, courtesy of National Lime Association)



moisture to 50 gal. by blading and aeration before laying down.

The pit material, loaded by dragline from a nearby stream site, was governed by a rather broad specification which required 0 to 5% retained on a 2-in. sieve, 30% to 75% retained on a  $\frac{1}{2}$ -in., 60% to 85% retained on a No. 40; liquid limit not over 50; plasticity index between 6 and 18, and shrinkage not over 10. The engineers found that the best stabilization results were obtained when the soil had a P. I. of about 15. A fair amount of clay binder hence was described and clay frequently blended in, since a part of the value of the lime lies in its chemical (puzzolanic) reaction with the clay to create an improved stability.



● Section of base about ready for application of protective emulsion coat pending surface treatment.

#### Another triple-deck grade separation takes shape



● Part of the latest segment of the New York State Thruway recently opened to traffic, is this three-level grade separation structure near Buffalo. The Thruway was scheduled to be open late in August from Buffalo to Utica. (United Press Photo).

#### Solutions to city congestion outlined

Some possible solutions for urban traffic congestion are presented in a new publication of the National Highway Users Conference. The liberally-illustrated, two-color booklet, "The City Traffic Muddle — What Exists?", presents, in question and answer form, the views of four recognized traffic experts who participated in a panel discussion at the recent Fifth Highway Transportation Congress in Washington, D. C.

Those quoted include Henry A. Barnes, director of traffic, Baltimore, Md.; Glenn C. Richards, general superintendent, department of public works, Detroit, Mich.; DeWitt C. Greer, Texas state highway engineer, and David L. Lawrence, mayor of Pittsburgh, Pa. Copies can be obtained by writing to the National Highway Users Conference, National Press Building, Washington 4, D. C.

## Less "State Line" Thinking, New Research,

*Presenting, in slightly condensed form, the presidential address of Earle V. Miller, given at the annual convention of the Western Association of State Highway Officials, Sun Valley, Idaho, September 16-18, 1954.*

THIS large assembly shows to me the continued and growing need of the breakdown of "state line" thinking in our mutual problems of financing, constructing, maintaining and operating our several State highway systems.

I placed finance first because it is the toughest problem confronting the highway administrators. How to raise the funds necessary to keep ahead of highway obsolescence and do it painlessly would be a miracle operation. But, it can be done if the people, press and public officials take a positive attitude toward the problem.

An organization in one State recently sent out an appeal for a study to be made of the President's 50 billion dollar road program, with the negative thought running through their appeal that it could not be done in their State. Apparently, they assumed that Federal-aid could be used only by the States that could match it in proportion to the 50 billion dollar program, and, therefore, if they did not accept the Federal-aid, there would be a gap in the continuity of the interstate system. That is negative thinking, "state line" thinking, if you will.

• Interstate cooperative financing was initiated and developed by Federal-aid legislation, which, in effect, caused the wealthier States to help finance their less fortunate sisters. These same wealthier States accepted the obligation, for the most part, gladly. Since 1921, no better formulae

have been devised than those used in the allocation of highway Federal-aid to the States.

With all its inadequacies, our highway system has a marvelous national continuity, due, in no small part, to far sighted Federal legislation. The equitable and unifying policies of the Bureau of Public Roads in the administration of Federal-aid have helped to make this possible. The AASHO and Regional Associations have reached agreements as to standards of construction, operation and maintenance of highways. The financing problem, however, has all too often been evaded.

The Highway Act of 1954 is the first realistic approach to the financing problem since World War II, not only because it increased highway funds substantially, but even more because it ordered Public Roads to make a comprehensive study of highway needs. . . Either we have been wrong in our needs analysis or refuse to recognize its financial implications. I suspect that the latter is true. Hence, I am tremendously encouraged by President Eisenhower's realistic approach to the problem.

• If the States could be assured of an adequate long range regular Federal-aid program plus an accelerated interstate Federal-aid program, I am convinced that they would be impelled to attack their financial problems with more determination and confidence.

In the West, we should not minimize the importance of our Forest Highway appropriations. At the present rate of spending, it will take 30 years to bring our Forest highways up to present standards. They will never be up to standard unless appropriations of at least three times the present rate are made available for a comprehensive 10-year program. Year-by-year planning doesn't seem to get us very far.

Logging on a sustained yield basis affects many miles of State highways

other than Forest roads. We see many operations, in the far West, where the logs are hauled out of the woods on timber access roads to State highways, then hauled 50 miles or more to mills over roads that have never received any forest highway appropriations and never will, because they are not on the Forest Highway System. Many of these roads were built for ordinary farm traffic, before sustained yield logging by truck was even imagined. The repetition of logging loads, even though within legal weight limits, is just too much for such roads. We are now confronted by the problem of reconstructing these roads at high costs.

In order to utilize our natural resources more efficiently, are we going to demand heavier and larger loads? Where are we going to draw the line? When the railroads increased their wheel loads and speeds, they put down heavier rails *first*. But in our business the demand for heavier highway loading comes first, the roads later.

• Highway loadings should be frozen at 18,000 lb. single axle and 32,000 lb. tandem, as now recommended by the American Association of State Highway Officials, until we can prove the economy of building highways for heavier loadings. In order to help us in these determinations, we have the results of the Maryland Test and soon will have the results of the WASHO Test. The AASHO is planning further tests. When all of these tests are complete, we hope to have some needed answers, even if we don't expect all of them.

• I recommend that we consider the desirability of a permanent national field research laboratory, where all kinds of highway materials and methods of construction can be tested against all kinds of traffic requirements. We need comprehensive, continuous highway research on a national scope. Occasional test projects,

## Urged by Miller at Sun Valley Meeting

even if done in big league style, are not enough.

One thing we did prove at the WASHO Test — all of the Western State Highway Departments are quite close together in their evaluation of pavement thicknesses and surface depths required to sustain repetitions of present legal loads.

• We have come a long way in the last few years in soil mechanics. I dare say that base failures in today's highways can generally be attributed to other than laboratory analysis or design specifications.

Engineering principles used in today's highway design and construction practices are so well substantiated that most of them are now accepted and applied. There are few areas of disagreement on the theories of speed design, sight distance, interchanges, channelization, widths and general geometries of the road. However, there are still questions as to how far we should apply new principles, such as the freeway concept, to today's highways. In other words, where should we start applying limited access principles or where should we apply the complete freeway principle? What exceptions should be made to a general plan for control or denial of access?

The Bureau of Public Roads has focused attention on these questions by requesting the State Highway Departments to provide full control of access on the entire interstate system. Some states have applied the freeway design principle only on the most heavily traveled highways, where the benefit to cost ratio for such a facility is high.

Perhaps, this Bureau memorandum will provide an answer to this question on the interstate system, but I still believe we should apply the same principles to any proposed highway of potential importance. It is much easier to talk about these controlled access highways or freeways than to

accomplish the results in the less populated States. California, Oregon, Washington and Texas are examples of Western states where freeways have been constructed with toll road characteristics, but without the tolls.

They have accomplished this result because of public acceptance of such projects. Their public relations work preceding the construction was tedious, thorough and effective. It is not unusual that the first reaction of the public to such planning is negative. People are allergic to changes, even though they admit the necessity. The smaller the state's population, the more difficult it is to sell the idea of the benefits of freeways.

The theories of bypasses, freeways, etc., are always fine for some other town but not here, they often say, because they feel that their town is different.

That sort of negative thinking can only be corrected through the right type of public relations work. A positive and factual approach by the State will eventually bring favorable support for any well conceived plan.

• Lately, there has been a tremendous increase in public acceptance of the need for an accelerated national highway program, as evidenced in activities sponsored by General Motors, National Highway Users' Conference, ATA, and others, as well as in national advertisements of such companies as Caterpillar, Fruehauf Trailers, etc.

Dissemination of factual highway information by such media is good, but the State Highway Departments should not fail to publicize the national needs, in addition to focusing local attention on local problems.

It is well that we highway people should always take a positive attitude toward our problems. We should think big, plan logically and act boldly. At the same time, we must be alert to new developments and theories, which may change rapidly all of

our current ideas about highway design and operations.

Who can say if or when speeds up to 100 miles per hour will be permissible?

Who can say if or when separate trucking roads will be built for 100 ton loads?

Who can say if or when jet or atomic power will be available in those trucks?

Who can say if or when new materials may be discovered to change the method of constructing roads for such traffic?

• We can dream all we want about the future, but we still have the real problems of the day to lick as we progress. Certainly we should look ahead and behind, only enough, to get a back sight to project the tangent of progress on a true course ahead.

Various studies and activities may be shaping up new highway policies and laws that will greatly accelerate highway activities nation wide. Apparently, we are at another cross road, and some people fear we may take the left road to full government control; other, the right hand road to complete state control.

I emphasize that neither will work alone and the best solution is to continue on the course already set by our national highway policies. If modified, modernized and realistically applied, we can get out of the highway muddle without any state sacrificing any rights, or being invited to evade its fair responsibilities.

Every state has a sphere of influence and obligation well beyond its borders; therefore, we must have reciprocal thinking beyond those borders. Only thus can we solve our mutual financial and operational problems, and establish appropriate standards of construction, design, maintenance, traffic control and safety. We must continue working together on those problems because they will always be with us.

# Roads and Streets in the News

## \$87 Million Spent on Ohio Turnpike

Ohio Turnpike construction work is expected to reach \$115 million during 1954, making it one of the year's largest roadbuilding efforts. About \$87 million will be paid out for the first nine months. The year's accomplishment along the 241-mile Ohio "Project I" will include 70 to 80 miles of dual concrete pavement, with the eastern 21.4 miles opened to traffic December 1.

These are some of the highlights of a progress report given to ROADS AND STREETS by the turnpike commission, which reports that the \$325 million project was 39.6 per cent complete as of August 15 and approximately on schedule. An idea of the combined pace of the contractors is shown by production figures for the week of August 28. These included 1,266,000 cu. yd. of earthwork, 11,249 cu. yd. of structural concrete, 101,770 sq. yd. of paving concrete and 1,250 tons of structural steel. Construction costs are in line with estimates, but right of way costs have eaten unexpectedly into the bond fund. According to a report by J. E. Greiner Company, the general consultants, right of way will cost \$18,500,000 compared with \$11,223,000 originally estimated. Partly for this reason the contingency fund of \$25,760,000 originally set up for building the road was down to \$10,563,000 on August 1, with \$16,000,000 still due to be allocated for sixteen service parks. This hurdle was expected to be overcome by the earnings from an investment of unspent funds which have totaled \$9,300,000 more than anticipated.

Other costs have also crept up,

utility adjustments being set at \$3,220,000 (up from \$2,170,000), and engineering at \$21,995,000 (compared with \$18,889,000).

### Financial Status of Ohio Turnpike Aug. 31, 1954

Estimated Available Funds	.....	\$336,002,000
<i>Estimated Project Cost</i>		
Preliminary		
Expenses	\$ 513,000	
Right of Way	18,500,000	
Construction	227,722,000	
Utility		
Adjustments	3,297,000	
Engineering	21,995,000	
Legal and		
Administrative	1,209,000	
Initial Maintenance		
Equipment:		
& Supplies	1,600,000	
Service Plazas	13,000,000 (1)	
Financing		
Expense	520,000 (2)	
Interest		
During Construction	37,082,500	\$325,438,500

Amount Remaining for Contingency ..... \$ 10,563,500 (3)

Notes: (1) Cost of Service Plazas not contemplated by original financing.  
(2) Other than Bond Discount.  
(3) Available for extra work, overruns in contract quantities, or other unforeseen conditions.

### Who pays for those utility changes?

Representatives of 25 public utilities met recently with officials of the Bureau of Public Roads to discuss the best means of carrying out Section 11, Federal-aid Highway Act of 1954.

This section of the Act directs the Secretary of Commerce to "make a



• Four of the turnpike routes recently announced in Illinois. Not shown is the National trail turnpike planned across central Illinois into St. Louis (United Press).

study in cooperation with the State highway departments and other parties in interest relative to the problems posed by necessary relocation and reconstruction of public utility services resulting from highway improvements authorized under this Act. Among other things, such a study shall include a review and financial analysis of existing relationships between the State highway departments and affected utilities of all types, and a review of the various State statutes regulating existing relationships."

The meeting was mainly concerned with the form and content of a suggested utility questionnaire prepared by the bureau and designed to provide basic information covering the costs, character, and extent of necessary relocation of public utilities along public highways.

### Illinois toll routes selected by governor

The routes of five toll turnpikes planned for Illinois were narrowed down in recent weeks, with the public announcement of mile-wide route strips. Determined from aerial maps made by Aero Service, Inc., and from location studies by Joseph Knoerle and Associates, the general routes will be studied for exact locations.

The five routes covering 465 miles and involving a possible \$583 million in projects are as follows: The East-West turnpike, leading from the Congress Expressway west of Chicago to Rockford (see map).

The North Illinois turnpike, tying in with the Northwest Expressway under construction in Chicago and leading west and north to the Wisconsin line, skirting Rockford.

The Tri-State turnpike, skirting Chicago from the Indiana line to the proposed Chicago-Milwaukee turnpike west of Waukegan.

The Chicago-Milwaukee turnpike, from the Tri-State turnpike northward to the Wisconsin line.

The National Trail turnpike (not shown on map). From St. Louis to Terre Haute, Indiana, roughly paralleling present U.S. 40.

Under provisions of the Illinois turnpike law Governor Stratton has full authority to make the final decision on the exact location of turnpike projects. It is anticipated that his views will provide the basic pattern, from which commission members and their engineers can set locations with minor changes.



● Look, ma — no side forms! This contractor-designed unit spreads, finishes and belts concrete slab between "runners."

## New "Slip Form" Concrete Finisher

*Unit built by Illinois contractor eliminates side forms, keeps up with dual-drum paver, meets smoothness specifications if subgrade is carefully prepared.*

A NEW concrete spreader-finisher that molds slab edges by the slip form principle, reportedly made a good account of itself on an Illinois state project during the 1954 summer. Conceived by Glen Perkins and William Dale of Quad-City Construction Co., of Rock Island, Ill., the unit placed as high as 1,040 ft. of 24' x 9" base course concrete in an 8½-hour day on Route U.S. 150 near Coal Valley, Illinois.

On this project consisting of 2 miles (25,907 sq. yd.) of base paving and related work, the contractor used a Foote 34-E dual-drum paver and the slip form machine, plus the usual operations of straight-edging and hand floating. Since the profile of the fin-

ished slab depended considerably on the evenness of the subgrade, special care was taken to blade and roll the grade to sufficient width (about 26 ft.) to provide proper support for the machine.

The self-propelled unit, designed to perform three operations, consists of a strike-off, vibrating finishing screed and transverse belt screed, mounted on a heavy frame which is carried on 22 ft. long crawlers. The steel slip forms extend under and to a point 14 ft. back of the machine. A full-width burlap drag is mounted on a cross frame at the rear end, which frame serves to hold the slip form rails parallel.

The strike-off consists of 2-ft. high

steel plates bolted together to span the full width of the slab. Each plate can be adjusted individually to secure the desired crown and slab depth. There are also three quick adjustments, one at each end and one in the middle, which can be made during pouring.

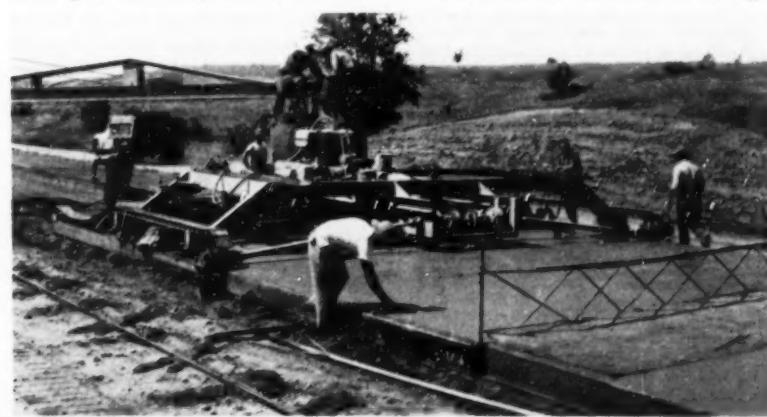
Behind the strike-off is a Master vibrating screed designed to finish the 24-ft. width to the 1½-in. crown specified for this job. The screed itself is mounted on the slip forms.

The final operation is carried out by a transverse belt screed which moves back and forth across the slab. Perkins and Dale used rubber belting, ½" x 18", instead of the conventional box-type screed. Perkins says the operation leaves a narrow rough edge on each side of the slab, but it does not essentially mar the workmanship of the job.

### Unit's "Plus" Features

Perkins and Dale are both pleased with the first machine's performance. "We think it's good," says Perkins. "It did a lot better job than we had ever hoped." Beside eliminating fixed side forms, the unit proved its ability to keep up with the paver and handle a 24-ft. pour satisfactorily. And it has proved easy to move from job to job. The 22-ft. tracks tend to iron out minor irregularities in grade. The contractor had no trouble in meeting the requirement of ¼ in. tolerance in 10 ft.

Because the two officers of the Quad-City Construction Co. are sold on their slip form finisher and because the machine has already aroused considerable interest in con-



● Showing a finished base slab — U.S. 150, Illinois.

## Back Fill Curbing and Trenches 5 TIMES FASTER!



MODEL 610  
POWER PACK  
HOPPER CONVEYOR

The Model 610 Hopper Conveyor backfills trenches and curbing up to 24" high with stone, cinders, sand, etc. in one-fifth the time required by previous methods. On the paving job shown above, 24" curbing was backfilled with crushed stone at a rate of 50 feet per minute.

Write today for information on this time-saving, cost-cutting unit for road widening and fill work. An actual demonstration can be arranged on your job.

DISTRIBUTOR FRANCHISE AVAILABLE IN SOME TERRITORIES

**POWER-PACK CONVEYOR CO.** 13910 ASPINWALL AVE.  
CLEVELAND 10, OHIO



With NEW Mechanical Tamping Attachment, which eliminates one man, assures more uniform structure and enables paver to run at faster speeds, the Dotmar Curb, Gutter and Sidewalk Paver is more than ever a true profit-maker. Pays for itself the first mile of paving. Is available with screeds for all standard curb and for integral gutter, curb and sidewalks up to 6' wide. Ends paving bottlenecks, is economical to own and operate! Send for Bulletin 53!

**DOTMAR**  
**AIR MITE**  
AIR HAMMER  
AND PNEUMATIC TOOL

Compact, soundly engineered, exceptionally powerful, the Dotmar AirMite is as easy to hold as a pistol . . . weighs only 3½ lbs., only 7" long, less fatiguing. Many safety features. Ideal for boring holes in concrete or masonry, cutting and trimming sheet metal, riveting, flattening, peaning, caulking and a hundred other uses. Can be operated with small, portable 1 h. p. compressor, with air pressure as low as 40 lbs. Available with wide range of tools. AirMite is yours at surprisingly low cost . . . will give years of economical, efficient service. Write for Bulletin 154 today!



**Dotmar INDUSTRIES Inc.**

501 HANSELMAN BUILDING

• KALAMAZOO, MICHIGAN

tracting and state highway department circles, Perkins and Dale have applied for patents on it. The original model was rented by Arcole Midwest Co. of Skokie, Ill., whose personnel used it to finish 88,000 sq. yd. of 24-ft., 9-in.-thick base course concrete on U.S. 150 near Bloomington. A second machine has been delivered to Arcole Midwest and additional machines are being built.

Improvements on the new machines will include a heavier drive assembly, as a safety feature; adjustability in width from 20 ft. to 24 ft.; and strike-off adjustability to varying thicknesses of slab from 7 in. to 10 in. The vibrating screed also will be adjustable to handle super-elevated curves.

The regular Illinois concrete pavement mix was used, with composition as follows:

Coarse Aggregate	(Size A	188.3 lb.
	(Size B	187.6 lb.
Sand		196.5 lb.
Water		4.9 gal.
Cement		1 bag
Cement Factor		1.43
Air Content (approximately)		4.0 %
Slump Averaged		2½ in.

The contract price for the 9-in. concrete base course was \$4.11 per sq. yd. The price for the 3-in. bituminous surface including prime coat was approximately \$1.20 per sq. yd.

## Personals

ROBERT H. LOCHOW has been appointed District Engineer of the Seattle (Wash.) office of the Portland Cement Association. Mr. Lochow succeeds Frank J. Barrett, who is retiring.

WILLIAM BUSSE has retired at age 90 as a commissioner of Cook County (Chicago), Illinois, after 52 years in public office. Mr. Busse helped pioneer in road work in the Chicago area and took an active hand in setting the road policies. He took occasion on his retirement to note the increase in real estate values brought about by better highways, particularly by the new metropolitan expressways.

T. F. LOUGHBOROUGH has retired as construction engineer of the Virginia Department of Highways. He had held this post since 1934.

ROBERT E. KILLMER has retired from the Texas Highway Department after 34 years of service. He was engineer-manager of the Dallas urban expressways and recently principal engineer consultant for the Dallas district of the department.



● Drill jumbo, served by aluminum pipe, combines 14 drills into a single rig.

## Aluminum Air Pipe Gets Rigorous Job Test

*Drilling methods used on dam job have application on heavy road and turnpike grading.*

**A** NEW COST saving tool for highway and heavy engineering contractors, the portable aluminum pipeline, is receiving a rigorous test during construction of the \$34,000,000 Roanoke Rapids Dam project of the Virginia Electric and Power Company in North Carolina.

Approximately 8500 ft. of 6-in. aluminum pipe is being used to supply compressed air to the wagon drills of Central Engineering and Contracting Corporation. This subcontractor is engaged in excavating over 1,000,000 cu. yd. of solid rock to

form the 8000-ft. long tail race for the dam.

The light weight of the aluminum pipe, and the ease of coupling and uncoupling, allow distinct cost savings in moving the air line as the job progresses. A 20-ft. length of 6-in. pipe weighs only 27 lb. and can easily be handled and connected by one man.

Central Engineering and contracting uses as many as six 600 cfm. diesel-powered air compressors to feed air to one of the several aluminum lines used. With 105 psi. pressure in the line, 8 to 10 wagon drills simultaneously get their source of power through the aluminum pipe.

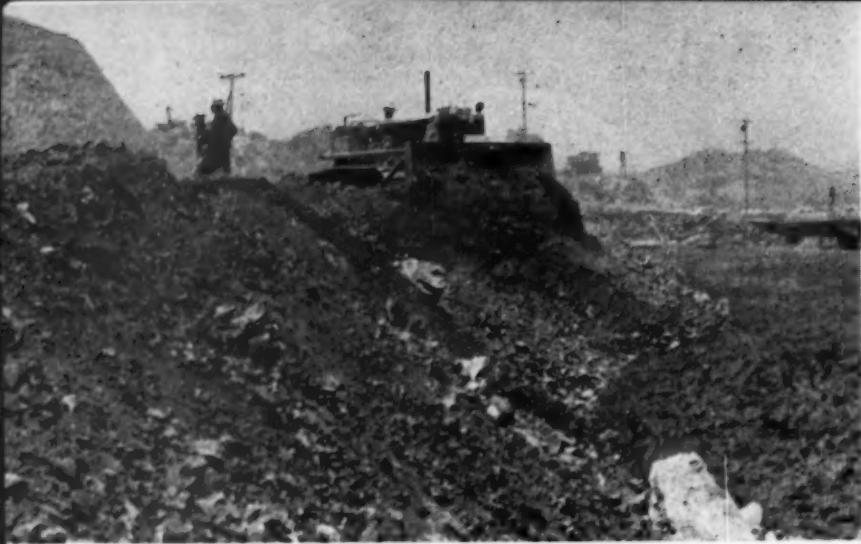
The aluminum lines are also used to supply compressed air to a special

"drill jumbo." (see photo). This unit consists of 14 drills assembled in a single rig that will allow simultaneous drilling of 14 holes. By speeding up the drilling operation, blasting and grading can in turn be accomplished more rapidly.

Fast coupling and uncoupling of the aluminum lines is made possible with aluminum alloy couplings supplied by R. M. Wade and Co. To connect the air lines with these couplings, sections of pipe are inserted in each end of the coupling and a locking pin is slipped into the coupling. A sleeve with an arm is attached to each end of the pipe sections to provide a means of attachment to the coupling. The pin when inserted attaches the arms to the coupling.

● (Left): 600-cfm Chicago Pneumatic compressors supply air through a 6-in. line. (Right): Showing the versatility of portable aluminum pipe. Two 6-in. lines carried across stream by suspension cable.





● Filling in progress on west approach, by contractor, John Delphia. Note mud wave boiling up at right, as fill material slides from height of 10 to 12 ft.

**A**N EFFECTIVE method of moving a mud wave out of the way, with the help of a surcharged fill and additional boosting by high explosives, was used on both the east and west approaches to the Richmond-San Rafael Bridge, near San Francisco. The method was tried out first by Parrish Bros., contractors from Benicia, Calif., on the west side, with perhaps even more spectacular results, by contractor John Delphia, of Patterson, Calif.

The west approach required 180,000 cu. yd. of fill material in 2,200 ft. of roadway distance, to form the necessary embankment to handle the freeway at that end of the bridge structure. The section consists of a heavy 85 ft. cut in hard digging, and from zero to 48 ft. of fill, built out over a mud shelf overlying solid bed-

## "Mud Wave" Trick Expedites Fill Job



- Earlier project on east approach employed similar "mud wave" technique. Note black mud being displaced in-shore. Caterpillar scraper and tractor, part of fleet which hauled down from nearby hill.
- One of Delphia's Wooldridge 17-yd. scrapers equipped with Ateco hydraulic ripper, on west approach filling.



rock. The problem here — as it was on the west side — was to devise a method of displacing this unstable mud with solid fill.

So successfully has it been done that the 850 ft. long fill on the west approach displaced in excess of 90 per cent of the underlying mud, when checked at the 45% completion point. Up to 35 feet of mud was displaced by the method.

The method made use first of the natural weight of fill material. Ripped out rock and earth from the big cut on the hill were hauled in, dumped near the fill edge and shoved toward the bay over the edge by bulldozers. This in itself started the underlying mud moving outward.

When the mass of mud and its inherent friction equals with the weight of fill, stubbornness usually developed. To prevent the fill from bridging the mud at such times, charges of high explosives were used to start the mud moving again. Blast holes were jetted in on 25 ft. centers, about 10 to 15 ft. out from the fill toe. Rainmaker pipe, a jet pump, and flexible fire hose were used for this operation. Up to 100 lb. of Hercules Vibragel was then used in each hole, and up to 10 holes touched off at once by tying each hole to a Primacord trunk line, and setting off the Primacord with a blasting cap.

Contractor Delphia used 3 Caterpillar D8's with 17 yd. Wooldridge scrapers, 3 D8's with dozers (one with Ateco hydraulic ripper), a Northwest 2½ yd. shovel, and 6 Euclid end-dump trucks.



Pellets of Peladow were placed on a cake of ice and their penetration rate was recorded.



The dark area in this enlarged photograph shows Peladow penetrating in only 45 seconds—illustrating its fast and effective action.

## HAVE YOU TRIED PELADOW FOR FAST, LOW-COST ICE CONTROL?

Buckshot-size pellets of high-test (94-97%)  
Dow calcium chloride offer faster action, easier  
handling, greater economy in reducing ice hazard

Quick low-cost removal of ice is essential for today's heavily traveled roads. That's why Peladow® is so popular with highway engineers who must effectively remove dangerous ice—fast.

These buckshot-size pellets of concentrated (94-97%) Dow calcium chloride speedily penetrate the ice, generating heat which accelerates the melting action. Applied with a mechanical spreader at the rate of one to four ounces per square yard (depending on conditions), Peladow works like magic—even in sub-zero temperatures!

Another popular ice control method is the use of Peladow-treated abrasives. Stockpiles of coarse sand or cinders,

treated with 50 to 100 pounds per cubic yard, stay freeze-proof, free flowing and easy to handle. This cuts loading and spreading costs.

The abrasives become embedded in the ice instantly—can't be swept away by wind and traffic— $\frac{1}{3}$  less abrasives are required. This sandpaper-like surface provides traction—helps protect lives and property.

For greatest economy, Peladow is shipped bulk in covered hopper cars, tank cars and trucks. Peladow, as well as conventional flake calcium chloride 77-80% (Dowflake®), is available in 100-pound moisture-proof bags. Contact Dow now for detailed shipping and handling information.

Write THE DOW CHEMICAL COMPANY, IN 981C, Midland, Michigan

*you can depend on DOW CHEMICALS*





## HOW TO SAVE 50% ON STREET WORK

### Athey HiLoader Cuts Costs for Los Angeles Contractor

Contracts for repaving of existing black-top streets in a new subdivision called for the removal of old surfacing and excess dirt. J. E. Haddock Co., Ltd., Los Angeles, contractors on the project, considered many loading methods and picked an Athey 125 HiLoader for the job.

The material to be loaded ranged from  $\frac{1}{2}$ " to 8" in size and included trash, debris and chunks of old paving. The Hi-Loader's full-floating paddle-blade feeder pushed 8 cubic yards a minute onto the tough conveyor belt. The swiveling discharge conveyor, angled 20° to the left,

fed the material to 8 and 12-yard trucks moving along with the loader.

Neal Saul, of the Haddock company, reports: "The HiLoader picks up all the material, leaving the sub-grade undisturbed and clean for paving. We saved many man hours of labor and eliminated refinishing of sub-grade!" *Costs were cut as much as 50%.*

Your Athey-Caterpillar Dealer can show you how a 125 HiLoader can save you money on any loading operation. Just give him a call or write direct.

- Rocks, roots and debris were handled without damage by the full-floating feeder. The swiveling conveyor eliminated lengthy truck maneuvers and HiLoader and truck speeds matched exactly.



**PRODUCTS  
CORPORATION**

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## Safety Jig for Scaffolding

PICTURED here is a safety jig originally published as suggestion No. 7381, Office of the Chief of Engineers, Safety Division (Safety Bulletin, first quarter, 1954).

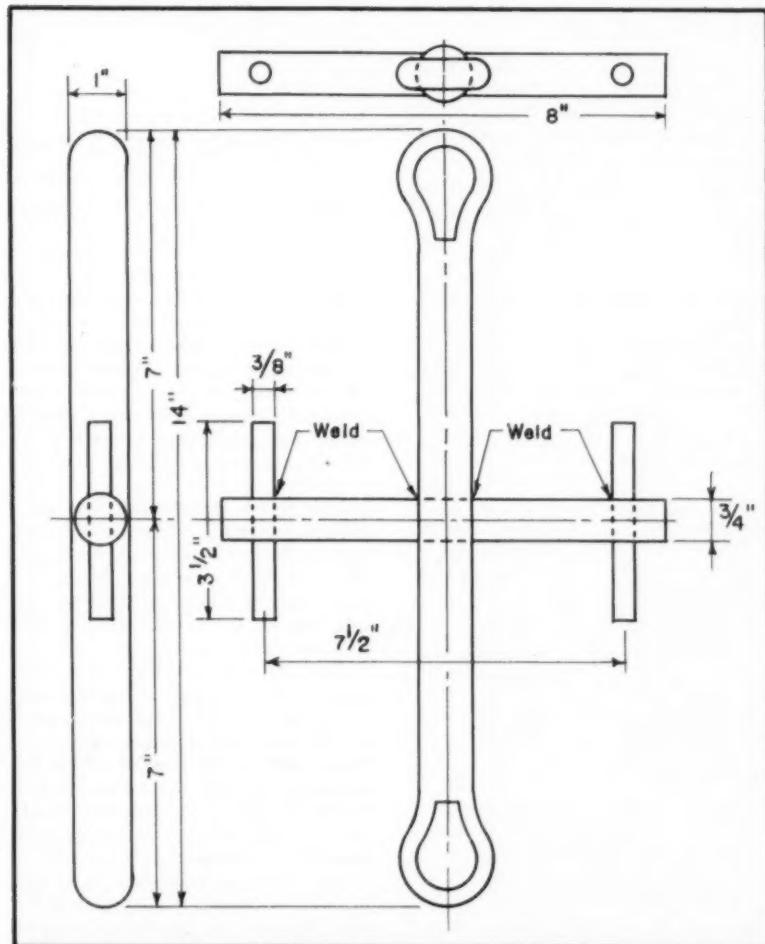
The jig is intended to furnish a fool-proof device for the raising and lowering of a boatswain's chair or scaffolding. Note that the rope passes through the top eye then around the left arm of the cross piece in the form of a half hitch and finally across to the right side of the cross arm with another half hitch.

This forms a snubbing action on the rope slack released by the operator, even if he inadvertently releases his hold on the rope.

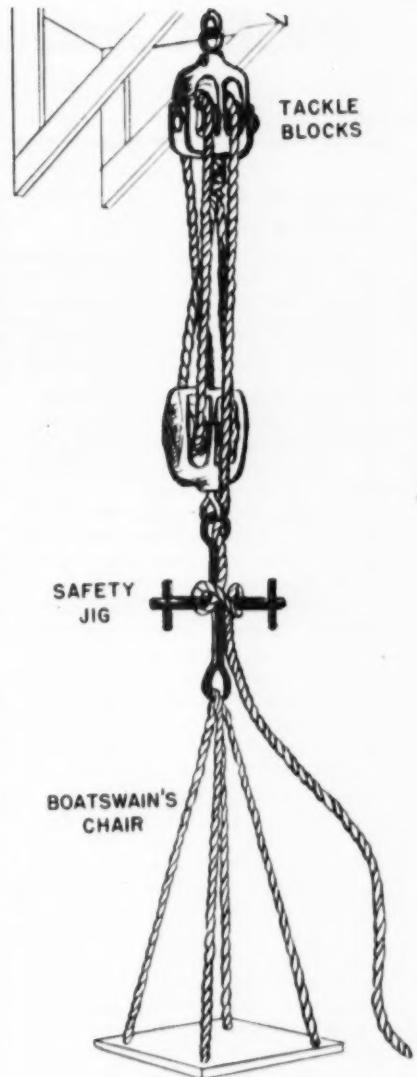
This suggestion has been adopted and put in use at an Ordnance Ammunition Center and is recommended by the Chief of Engineers' staff as of practical value at installations which require work at high levels. It would seem to have frequent application in connection with highway bridge work.

### Moving machinery hazard

A contractor's rigging superintendent was seriously injured in an accident involving installation of cable on hoist drums, when he stepped on frame of hoist while machinery was moving. Employee's foot slipped and



● Details of the jig -- use of high tensile steel recommended.



● Metal safety device which permits a secure rope snubbing for lowering of a chair or scaffolding.

dog and brake assembly pulled his right foot and leg between end of drum and frame. Result: Amputation of right leg above knee.

From *Safety*, May, 1954, published by Corps of Engineers, U.S. Army, Missouri River Division.

### Loader used as pile rig

The use of a Hough Model HO loader to drive steel pipe piles with a McKiernan-Terry 9B3 hammer is reported by the W. F. Magann Corporation of Portsmouth, Virginia. This method was used where working head room was low. The loader also served double duty in loading out dump trucks on light excavation.

# DIGEST of Current Technical Literature

By JOHN C. BLACK, Associate Editor

## Problems of swelling soils

In seeking maximum supporting power from subbases we look first at density, but contrary to much popular belief this is not always the criterion. High compaction at low moisture content is conducive to future swelling unless all further moisture can be excluded. Such swelling may damage pavements directly, and lowered stability will reduce the supporting power of subgrades.

A "high-swelling" soil is one which expands appreciably when wet. Fine grained clays and clay silts are the usual offenders.

Determinable relationships between density, moisture, "swell pressure," stability, and supporting power permit a rational design of subbase. The author's modification of the old density rule reads: "For any one degree of saturation, an increase in the density of a soil will bring about an increase in the strength of that soil."

Compacted soils expand because the attraction of their individual grains for water is stronger than the forces holding the grains together. The process is limited by lack of water or by any confining force. On a subgrade the confining force is the weight of the pavement. If a subgrade consists of a high-swelling lower layer and a non-swelling upper layer, the swelling effect is limited by the combined weight of the upper layer and

the pavement. Addition of such an upper layer is often the most economic means of obtaining necessary strength and stability.

Recent tests at the materials laboratory of Washington State Highway Dept. have established relationships between "swell pressure" and other soil properties. Conclusions are presented in text and graphs. Most important for immediate practical use is the method of determining necessary depth of fill to maintain stability. Data for such are not presented, but must be supplied in each case.

*"How to Handle Swelling Soils," by R. V. LeClerc, Senior Materials Engineer, Washington State Department of Highways PACIFIC BUILDER AND ENGINEER, 2418 Third Ave., Seattle 1, Wash., August, 1954.*

## Barrier curb test

Eleven barrier curbs of designs used on bridges were tested by the Materials and Research Department of California Highway Commission.

One hundred forty-nine full scale impact tests were made at angles of 5, 10, 15, 20 and 30 degrees, and at constant speeds ranging from 5 to 50 miles per hour. Test vehicle was a standard stock sedan, with special protective equipment for the driver.

Purpose of the study was to determine respective behaviors of the 11 standard designs — not to develop new designs. All the curbs had

smooth concrete faces except VI-M, which was metal-faced but otherwise identical with Curb VI. Curb X is not generally regarded as a barrier but was tested to show its resistance to "mounting." As anticipated, this proved low.

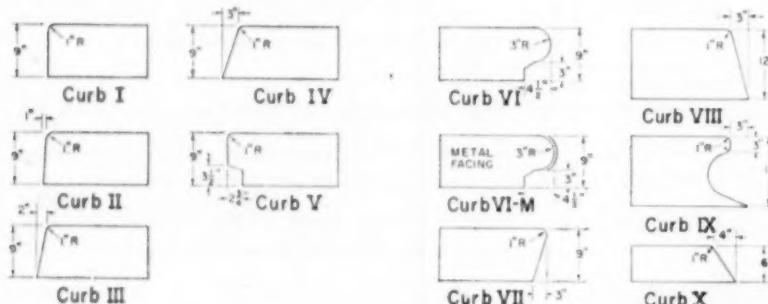
Curbs V, VI-M, VII and IX gave best results. At collision angles of 5 to 15 degrees, Curb V proved overall the most effective. It not only prevented climbing "but also acted as an external brake on the forward motion of the car. This latter action also caused postcollision travel of the car to be close in and parallel to the curb. Mounting of this curb was relatively easy at 20 degrees and higher. Curb VI-M was more efficient than Curb V when considered only as a barrier. It had two drawbacks: first, little or no retardation of velocity of the colliding vehicle; second, a "tripping" action of the vehicle at the higher speed. Lack of retarding action of this curb resulted in the test car ricocheting off at an angle and speed very nearly equal to the approach angle and speed.

This curb VI-M was tested at angles up to 20 degrees and at speeds up to 45 miles per hour. The vehicle did not mount nor even partially climb the curb but any further increase in speed probably would have overturned it. The identically shaped Curb VI with plain concrete face served as a barrier to the vehicle only at low angles and speeds. It was mounted immediately at all angles above 5 degrees, and even at 5 degrees it was mounted at 30 miles per hour."

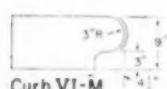
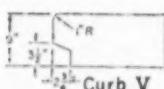
The two 12-in. curbs proved to be effective barriers, but neither had the braking power of V nor was more effective as barrier than VI-M, except that the "tripping" action was less. Many observations on the various types are reported.

On the test vehicles "the outer sides of front and rear contact tires were painted with cold water paint — the front tire red, the rear, green. This paint readily rubbed off on the curb showing tire contact and roughly the height of the climb." Photography, including motion pictures from three different angles, was used.

The test car was thoroughly examined for damage after each collision. Twelve "A" frames, 10 wheels and various other car parts were used up. No person was hurt in the tests.



These curbs were tested and ----



---- of the 9" high curbs these two proved most efficient.

● Curb designs used in California test.

**"Barrier Curbs,"** by J. L. Beaton, Supervising Engineer, Materials and Research Department, CALIFORNIA HIGHWAYS AND PUBLIC WORKS, P. O. Box 1499, Sacramento, Calif., May-June, 1954.

## Drilling and blasting on current job

The F & S Contracting Co., of Butte, made the records noted below on the Polson-North Highway realignment in Northwestern Montana.

Holes were 4-inch. The 600-cfm. compressor (operated at times while standing on a slope) developed operating pressure of 120 lb. in less than one minute from start.

The outfit drilled about a foot a minute in hard shale, averaging 210 ft. per shift, including moves.

Biggest single shot was 22,000 lb. of 40%-60% bag powder, bringing down 35,000 yd. of rock. Some holes were 55 ft. deep. Centers averaged between 10 and 12 ft.

*"New Drills and New Trucks Make Mark in Heavy Rock"* by John Forsen, PACIFIC BUILDER AND ENGINEER, 2418 Third Ave., Seattle 1, Wash., August, 1954.

## Three-phase signals handle more traffic

Traffic-actuated signals, operating on a 3-phase system to permit left turns without undue hazard, have proved highly effective at congested intersections on California highways. They have reduced accidents at numerous points where grade separation are needed but are ruled out by lack of funds; and by means of the "double split-phase" system, minimize traffic delay due to left turns.

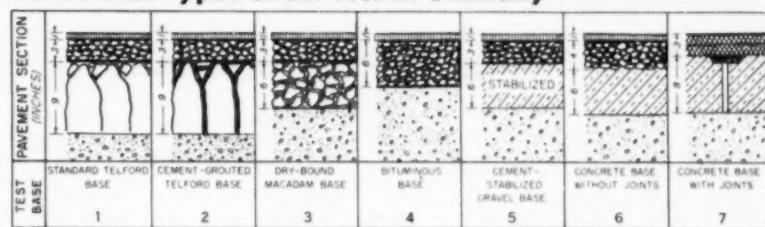
The general problem of the left turn is discussed, and the five different arrangements of signal indications involved in the double split-phase system are described. Traffic diagrams are shown for each.

Timed signal operation, traffic-actuated operation, and partial traffic-actuated operation are considered. Necessity for the coordination of adjacent signals through traffic progression is noted.

An interesting item is the use of "sampling detectors" in the various traffic lanes to provide necessary information for proper selection of cycle length and direction of offsets.

*"Use of Three-Phase Traffic Operated Signals,"* by G. M. Webb, Traffic Engineer, Division of Highways, CALIFORNIA HIGHWAYS AND PUBLIC WORKS, P. O. Box 1499, Sacramento, Calif., May-June, 1954.

## Seven base types under test in Germany



- Design details of test bases.

A long-range research program, initiated in 1952 in Western Germany has as its object and scope to test and evaluate different base types which are deemed suitable for bituminous surfaces. The project also is to afford comparison of two types of bases long "standard" for heavy traffic highways in Europe — the Telford base and the Portland cement concrete base.

All bases except No. 4 and No. 7 were covered with an intermediate course, consisting of 3 to 4 in. of standard penetration macadam (road tar type). The surface of the wearing course for base No. 7 consisted of asphaltic concrete 1½-in. thick on a 1½-in. asphaltic binder with 4 per cent asphalt cement content. The remaining test bases were surfaced with 55 to 130 lbs. of asphaltic plant-mix surface course (% to 1½-in. thick).

**Design features and material quantities of the selected sections are:**

**Base No. 1:** Hand-packed standard Telford base, consisting of large stones approximately 6 by 8 by 9 in., keyed with 185 lbs. of sandy gravel per square yard.

**Base No. 2:** Telford base as above, but grouted with 11 gal. of cement mortar per sq. yd., finished with vibratory base plate compactors.

**Base No. 3:** Dry-bound macadam base, consisting of coarse crushed rock 1½ to 3½ in. in size, 430 lbs. per square yard, compacted with a 14-ton power roller, covered with 65 lbs. of screenings per square yard and vibrated.

**Base No. 4:** 6-in. bituminous hot-mix base course; local sand-gravel mixed with 4.7 to 5.2 per cent of 80-penetration asphalt cement in a central plant; mechanically laid in three courses (Figure 3), compacted with a 7-ton power roller.

**Base No. 5:** 6-in. cement-stabilized base, utilizing the sandy gravel of the embankment; 420 lbs. of Portland cement per cubic yard of compacted base, finished with vibratory equipment (Figure 4).

**Base No. 6:** 6 in. of Portland cement lean concrete base without joints; local sand and gravel mix, 246 lbs. of Portland cement per cubic yard of concrete (28-day compressive strength of 1,280 to 2,280 psi), finished with vibratory baseplates.

**Base No. 7:** 8 in. of Portland cement concrete base with transverse expansion joints spaced at 165-ft. intervals; locally available gravel mix, 305 lbs. of cement per finished cu. yd. of concrete (28-day compressive strength of 1,425 to 4,275 psi); vibration-finished.

Considerable time will be needed to reach final conclusion.

*"Bituminous Test Road in Germany,"* by W. T. Zoepf, THE MILITARY ENGINEER, The Mills Building, Pennsylvania Ave. at 17th St., N. W., Washington, D. C., January — February, 1954.

## Dilute asphalt emulsions preserve road surfaces

Raveling and hair-racked surfaces, whether due to lack of asphalt in the original construction or to lack of traffic to make the asphalt react properly, have been successfully treated with very light applications of diluted asphalt emulsion. Best results came from mixture of 10 to 15% emulsion in 90 to 85% water, applied at a rate giving 0.02 gal. of residual asphalt per sq. yd. Rates of 0.03 gal. have been used successfully, but the 0.06-gal. used on the original test run in Sept., 1953, proved too heavy. Where a single application is inadequate it may be followed by others. As many as 4 have been needed in some cases.

In District 7, "it is the usual practice to place the emulsion in an ordinary water truck, then to add the water, depending upon the addition of the water and the motion of the truck to do the mixing. The sprinkler bars are equipped with larger holes and splatter plates to obtain more uniform distribution. We have found that with our sprinkler trucks, trucks, equipped with 8-ft. spray bars, driving about 12 miles per hour, and using a mixture of 10% emulsified asphalt, approximately 0.02 gal. of asphalt is applied per sq. yd.

"Of course it is necessary to vary the speed as the tank empties to insure uniformity in application. It is of prime importance in this method that each application be allowed to break and cure completely before succeeding applications are made. In any event, traffic should be kept off the treated surface until there is no longer danger of the asphalt film being picked up. This will be probably 30 minutes to one hour."

The thin asphalt surface film is soon worn off, thus restoring the original color of the pavement."

*"Diluted Emulsion Seals,"* by J. C. Roberts, Engineer, District 8, and J. T. Kelly, Engineer, District 7, TEXAS HIGHWAYS, Information and Statistics Division, Texas State Highway Department, Austin 14, Texas, May, 1954.

## County Leaders Plan for Bigger Programs Ahead

Highlights from ARBA's County Conference held at Columbus, Ohio, September 10-13, 1954. Excerpts from selected meeting papers on stabilization, contractor-engineer relations and other topics will be presented in a later issue.

The need for county road people to plan now for larger programs in the offing was one of the keynotes at Columbus, Ohio, on the occasion of the American Road Builders Association's second National Conference of County Engineers and Officials. In outlining the big job shaping up through anticipated federal and state legislation, General Eugene Reybold, ARBA's executive vice-president, also spelled out the reasons why county officials should make fullest use of the contract method of performing construction.

Over eight hundred delegates and visitors attended the three-day conference, which has taken its place as one of the major yearly gatherings.

The dangers inherent in too much force-account expenditure of road funds was also voiced by another speaker, congressman Harry J. McGregor, chairman of the House Committee on Roads. The congressman bluntly told the gathering, in effect, "don't go hog wild on force account, or you will ruin the Highway Act of 1954. . . You are going to be in the road business more than ever before in the next few years. What you do in the period ahead will determine whether road funds go back under federal control." The congressman recommended that his listeners "take advantage of the contract method wherever feasible" in implementing their future highway programs.

### Problems Ahead

Urging engineers to imagine the impact of a \$50 billion highway program upon their operations, General Reybold enumerated some of the problems that would have to be faced in the near future.

• Materials: Are they going to be in adequate supply? Can the industry assure us of that?

• Machinery: Will equipment be available? Is that possibility on paper?

• Personnel: Are the counties build-

ing up their staffs or the potential by due regard for salaries for engineers?

• Right-of-way: Is acquisition of right of way being speeded for the roads that must be built when the money finally becomes available?

• Contractor capacity: Will the industry be geared for aggressive and efficient operation so that the public will get its money's worth?

"These are the potential bottlenecks," the ARBA official said, "The greatest challenge we have yet faced in road building is now being thrust at us. Don't fight the problem, face it," he declared.

Aware of their increased responsibility under the new federal Highway Act in planning and construction of federal aid secondary roads, the county officials gave sober attention to such talk. The question of matching the aid funds and the lack of engineering services appeared to be the persistent problems most discussed at the three-day gathering.

For example, B. M. Browne, county engineer from Kansas City, Kansas, admitted that although his situation was exceptional, he observed that "mighty few of the other county engineers know where or how they can get more highway studies to back up our requests. Most counties just don't have the staffs to do that research."

### Engineers Needed

A number of other county officials voiced their fears about the lack of engineering help available. Walter Johnson, secondary road engineer of the Kansas State Highway Commission, pointed out that only half of the states have county engineers in charge of local road administration. Only six or eight states have engineers in charge in all of the counties. Available studies indicate that these few states provide the most efficient administration and adequate local roads, he said.

Professor John E. Stoner of Indiana University also supported this view, describing Minnesota as exemplary in this respect. He noted that in Minnesota in 1954 every county in the state but one had a Federal-aid-to-secondary roads program, and that one was in a special Federal-aid program.

Comparing the record of Minnesota counties in the use of FAS funds with that of another state, Professor Stoner noted that in the second state

only about half of its counties have ever used FAS money. And as of the last of July of this year just about one-fourth of the counties of that state had FAS programs in effect. One factor in these divergent records, is that in Minnesota every county has a registered highway engineer working with a board. The other state has county boards but few registered engineers.

R. H. Justen, Johnson County (Iowa) engineer, reported results of a survey of county engineers' salaries in Iowa. Low salaries are frequently cited as cause for the shortage of highway engineers. Justen revealed that the average salary paid to an Iowa county engineer is now \$6,044 or 56% above that paid in 1947. The average salary of an assistant county engineer is \$4,334, and the range ran from \$3,120 to \$5,800.

Pooling of engineering service by smaller neighboring counties was recommended by Congressman McGregor. A multi-county consolidation of highway engineering operations, he observed, can often be a practical way to meet the need and make available competent engineering services which otherwise could not be economically justified.

### Report made on Minnesota road needs

The Automotive Safety Foundation has made a report of its survey of Minnesota road needs to the Highway Study Commission. The Public Administration Service also has presented a financing plan based on the needs report. Costs are estimated at about \$152 million annually for ten years, and it is proposed to increase the gasoline tax from 5 to 7 cents a gallon and impose a mileage tax on heavier trucks. Passenger cars would pay a flat fee of \$13 annually, as against an average of \$18 at the present graduated schedule.

### Complete county air map

Mapping of the 864 sq. mi. of Kent County, Michigan, has been completed by aerial photography, according to Otto S. Hess, engineer-manager of the county road commission.

The map prepared by Abrams Aerial Survey Corporation brings up to date a 1933 aerial survey, and provides the local government authorities with complete data to aid in highway planning.

The project involved taking 1824 pictures each 9x9 in. and each covering  $1\frac{1}{2} \times 1\frac{1}{2}$  miles, with overlap. The pictures were of the stereoscopic type for three dimensional viewing to study terrain.

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New Ford F-700 BIG JOB is the low-cost leader of extra-heavy work. Up to 19,500 lbs. GVW, 34,000 lbs. GCW. New gas-saving, Low-Friction 138-h.p. Power King V-8.

## New driver comfort cuts trucking costs!



Deluxe Cab shown, extra cost.

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Only a Ford Truck gives you full benefit of these savings. For only Ford has the *Driverized Cab*, most comfortable of truck cabs, with its time-saving controls. For complete information, see your Ford Dealer, or write: Ford Division, Ford Motor Co., Dept. T-14, Box 658, Dearborn, Mich.

**New Driverized Cabs** cut fatigue! Big, curved, one-piece windshield for better visibility. Exclusive Ford seat shock snubbers to level the ride. New non-sag springs. New, free-breathing woven plastic upholstery that lasts longer, gives year-round comfort.

"Cut your speed  
after dark."

### SAVE WITH ALL THREE!

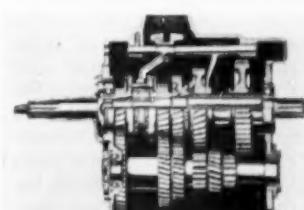
1. Gas-Saving Power!
2. Driver-Saving Ease!
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And . . .

Ford Trucks last longer, too!



Electric-shift 2-speed axle has faster, more positive shift action than vacuum type. Convenient button control on gearshift lever.



Synchro-Silent transmission for shifting ease. Four-speed standard, 5-speed direct (shown) or overdrive at extra cost.

## FORD TRIPLE ECONOMY TRUCKS

# Oklahoma Overhauls Its Specifications

*The contractor's association and also material and equipment leaders were consulted in a complete revision, designed to clarify meanings and take advantage of new mechanical and technical developments.*

A GOOD many state highway departments recently have been busy bringing their construction specifications up to date. The problem of confusing and antiquated specifications was considered so important that it had top place on the agenda at the AASHO Pittsburgh meeting in November, 1953. A paper on the subject presented there by W. C. Peterson of the Bureau of Public Roads was published in full in *ROADS AND STREETS* (March, 1954).

In the course of checking into this subject the *ROADS AND STREETS* editors learned that the Oklahoma Department of Highways is regarded as a leader in the modernization of its specifications, the new edition of which was due off the press this October. Contractors and engineers in other states, hence may be interested in the following comment, received by correspondence from C. H. Bittle, chief engineer of the Oklahoma department.

## Mr. Bittle's Comment

To the Editor:

In revision of the Oklahoma Highway Commission's Standard Specifications we have endeavored to write specifications that will be technically accurate and adequate, definite with respect to requirements and conditions, equitable to all parties, economically operative, yet comprehensive enough to allow practical interpretation, which will minimize misunderstanding between the Engineer and the Contractor.

To accomplish this type of specifications all available information concerning construction of all types was consulted. For the actual construction phases, members appointed by the association — material men and equipment men — were consulted, and every consideration was given to their recommendations. From the original drafts many conferences were held with the department heads and members of the Bureau of Public Roads. From these meetings the final drafts were completed.

In general, our specifications are divided into seven sections, namely:

(1) General Provisions, (2) Earthwork, (3) Base Courses, (4) Surface Courses, (5) Structures, (6) Incidental Construction, and (7) Materials.

In General Provisions, we have covered more thoroughly definition of terms and have added a section to cover the Control of Material.

In Earthwork, we have included sections to provide for more stable subgrade constructions required for the highways of today and years ahead. Layer construction and a minimum density of 95% of Standard Proctor Density will be required.

In Base Courses, specifications covering base courses which were used in the years past, have been replaced with specifications for base courses which more nearly fit the requirements of modern-day traffic.

The three principle types of base courses, Soil Asphalt, Soil Cement and Stabilized Aggregate will be covered in the 1954 Specifications. A minimum density of 95% of Standard Proctor Density will be required except for Soil Asphalt. A rational method for density control of Soil Asphalt has not been developed.

Surface Courses has been revised along the same line as Base Courses to provide surfaces capable of carrying the modern-day traffic. Many types of surface courses have been covered, the principal types being Portland Cement Concrete, Asphaltic Concrete and Pre-Mixed Bituminous. Revisions were made of considerable consequence in the specifications for Air-Entrainment, Sawing of Contraction Joints, Transit Mixed Concrete, Wet Batching, to name a few. Specifications for the other types have undergone many revisions through the years, and there has evolved certain basic controls adapted to this area and design for the most durable surface consistent with over-all costs.

In Structures, there have been many revisions made to provide for the construction requirements of today. One section — that of Design — Specifications have been written which conform (in the main) to the AASHO Specifications but with some modifications, which in some cases are simply clarifications, and in oth-

ers are changes to make our specifications fit more closely our particular requirements. In no cases have our requirements for design been lowered from the AASHO Specifications and in certain instances our specifications are higher.

In Incidental Construction many items have been added — in fact, many more than in any other section. Most of these have been fostered by the advancement and type of present-day construction. Such items as sodding, planting, seeding and fertilizing, which everyone feels is needed for the protection of today's construction. Other items covering the various types of traffic markings have also been added.

In Materials the specifications have undergone many changes. Constant and close attention to the modifications of test procedures of highway materials has indirectly focused the attention of the Materials Department to the AASHO and ASTM specifications for these materials and their adoption in so far as practical.

In order to keep abreast with the best current practice some materials specifications have been revised to conform with such AASHO and ASTM revisions. Also, there are instances where the trend toward adoption of such standard specifications is impractical, however, such instances occur wherein the breadth of these standard specifications include materials not commercially available or predominate in Oklahoma. Conversely, there are instances wherein more restrictive specifications are more practical than these general specifications written to cover the entire nation. We have done this in our new specifications.

## Rear-light study

The importance of adequate lighting on the rear of trucks is getting new attention through a study by the Interstate Turnpike Safety Committee. This group which met recently at Columbus, Ohio, considered preliminary test data taken at truck weighing stations, which show that truck lighting is frequently below standards set by the Society of Automotive Engineers as required by the Interstate Commerce Commission.

The tests were made by a new light measuring device developed by General Electric Company called a "color corrected photometer."



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## New Publications

### Proceedings, California conference

PROCEEDINGS OF THE 1954 CALIFORNIA STREET AND HIGHWAY CONFERENCE are on sale by the University of California Press, Berkeley 4, Calif. Price: \$2. The California conference is presented annually by the Institute of Transportation and Traffic Engineering of the University. It draws road men from all levels of government and the industry.

The 1954 Proceedings (159 pages) contain 43 papers and panel discussions under six general headings: highway law; economics; planning and standardizing; urban transportation; traffic and safety; and engineering, construction, maintenance.

Among participants whose papers appear in the 1954 Proceedings are: Wilfred Owen, The Brookings Institution, Washington, D.C.; Light B. Yost, Secretary, Business Advisory Group, White House Conference on Highway Safety; J. O. Mattson, Presi-

dent, Automotive Safety Foundation, Washington, D.C.; C. M. Nelson, Editor, Better Roads, Chicago; and H. A. Radzikowski, Chief, Maintenance Branch, U.S. Bureau of Public Roads, Washington, D.C.

PROCEEDINGS OF 15TH ANNUAL HIGHWAY ENGINEERING CONFERENCE, University of Utah, College of Engineering, Salt Lake City — compiled and edited by A. Diefendorf, to whom request for copies should be addressed for this 160 page summary of technical papers given at the Conference.

PROCEEDINGS, ASSOCIATION OF HIGHWAY OFFICIALS OF NORTH ATLANTIC STATES (30th Annual Convention, March, 1954). Published by secretary of association, 1035 Parkway Ave., Trenton, N.J.

ROADSIDE DEVELOPMENT COMMITTEE REPORT. Presented at 31st annual meeting of the Highway Research Board. 80 pages. Several valuable articles on this subject as presented by the committee on roadside development headed by Frank M. Brant. Price: \$1.35. Address The Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C.

A CRUSADER SPEAKS OUT FOR ADEQUATE ROADS. Effective semipictorial booklet issued by the National Highway Users Conference, presenting facts and picturization on highway needs as stated by Clem Johnson, President of the Chamber of Commerce of the United States, in his address before the fifth Highway Transportation Congress in Washington, D. C. For copy address the National Highway Users Conference, National Press Building, Washington 4, D. C.

"SURVEY AND TREATMENT OF MARSH DEPOSITS." Bibliography 15, with annotation, containing 155 references. Published by Committee on Survey and Treatment of Marsh Deposits, O. L. Stockstad, chairman. Address The Highway Research Board, 2101 Constitution Avenue,

BIOGRAPHY ON PRESTRESSED CONCRETE. 84 pages of items as prepared by the ACI — ASCE Committee 323 on Prestressed Concrete, A. E. Cummings, chairman. First edition August, 1954. Price \$2.00 remitted to the American Concrete Institute, 18263 West McNichols Road, Detroit 19, Mich.

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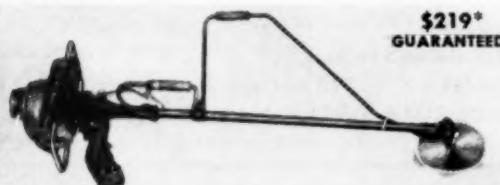
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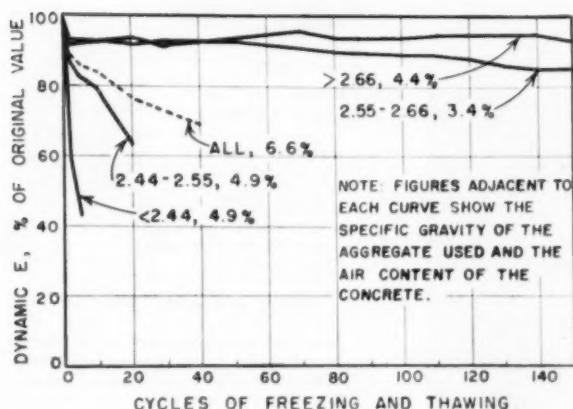
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### Correction please on "Heavy Media Separation" article

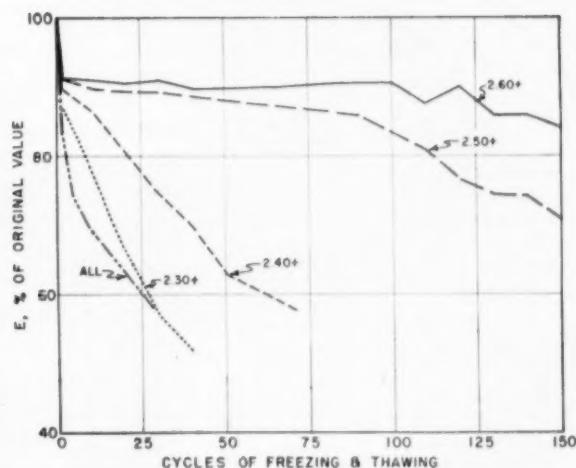


● Fig. 1—Durability of concrete made with individual specific gravity fractions of a gravel with poor field performance.

In publishing the article by D. W. Lewis entitled "Heavy Media Separation of Gravel Aggregates," beginning on page 84 of August ROADS AND STREETS, the major error was made of transposing the two graphs illustrating the data. These graphs are reproduced herewith, switched around so

that each has its proper caption. We wish to thank the various readers who have called this error to our attention. — Editors.

● Following the lead of Kansas last year the Nebraska department of roads is reportedly trying to hire en-



● Fig. 2—Durability of concrete made with poor gravel aggregate — particles lighter than specific gravities shown where removed by heavy media separation.

gineering school graduates from Brazil and Chile. The department which needs 50 professional engineers and 60 engineering assistants for its expanding road-building program has counted on getting only three June graduates from the University of Nebraska, according to a news item.

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## Meetings Ahead

AMERICAN SOCIETY OF CIVIL ENGINEERS — Annual convention, Statler Hotel, New York, N. Y.; Oct. 18-22.

CANADIAN GOOD ROADS ASSOCIATION — 35th annual convention, Royal York Hotel, Toronto, Ontario; Nov. 8-10.

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS — Annual meeting, Olympic Hotel, Seattle, Washington; Nov. 9-11.

NATIONAL SAND AND GRAVEL AND NATIONAL READY MIXED CONCRETE ASSOCIATIONS, — Annual meeting, Miami Auditorium, Miami, Fla.; Jan. 9-13.

AMERICAN ROAD BUILDERS ASSOCIATION — Annual meeting, Roosevelt Hotel, New Orleans, La.; Jan. 10-13.

CONSTRUCTION INDUSTRY MANUFACTURERS ASSOCIATION — Annual meeting in conjunction with ARBA meeting, New Orleans in January.

ASSOCIATED EQUIPMENT DISTRIBUTORS, INC., — 1955 meeting, Conrad Hilton Hotel, Chicago, Ill.; Jan. 23-28

NATIONAL CRUSHED STONE ASSOCIATION, — Annual convention, Netherland Plaza Hotel, Cincinnati, O.; Feb. 7-9.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS — Annual meeting, Jung Hotel, New Orleans, La.; February 7-9.

AMERICAN CONCRETE INSTITUTE — Annual convention, Schroeder Hotel, Milwaukee, Wis., Feb. 21-24.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. — Annual convention, Roosevelt and other Hotels, New Orleans, La.; Mar. 14-17.

## Institute appoints Royer



Merritt R. Royer has been appointed District Engineer for the Asphalt Institute for the area covering Arkansas, Eastern Kansas, Missouri and Eastern Nebraska, with headquarters at 15 West 10th Street, Kansas City, Missouri. He comes to the Institute after 20 years experience with Kansas State Highway Commission.

## SAFETY FROM A SINGLE SOURCE

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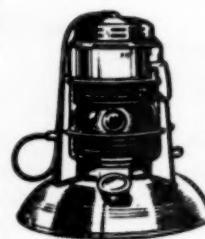
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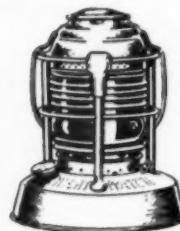
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## Letters to the Editor

To the Editor:

I read with interest Mr. Nevitt's article on "Dryers" in the May issue **BITUMINOUS ROADS AND STREETS**, and feel that he presented the problem very well in a general way.

However, Mr. Nevitt did not mention another necessary part of an asphalt plant which is closely integrated with the drying of the aggregates, namely dust control.

Several years ago I faced the dual problem in the operation of an asphalt plant in a residential district of Chicago of controlling the stack dust while attempting to dry 120 tons per hour.

We called in the Hauck Manufacturing Company as their low pressure burners were on the plant and were advised by them that proper drying of our aggregate required 18,000 cu. ft. of air for each ton of aggregate to be dried. Since we desired 2 tons of dry aggregate per minute we needed 36,000 cu. ft. of air per minute which was about twice as much as our exhaust fan was delivering.

This information set off a chain reaction of conferences with the American Blower Company resulting in our installing a 36,000 cu. ft. per min. cyclone collector with a 12-in. screw conveyor to the hot elevator for the recovered material, a large capacity exhaust fan powered by a 100-hp. direct drive electric motor, and finally an air scrubbing tower to clean the final exhaust by means of water sprays. This final operation had to be of ample capacity to insure the reduction of the velocity of the air as it came from the exhaust fan so that it would be susceptible to washing and at the same time move freely through the tower to avoid the creation of back pressure which cuts drying capacity.

I am happy to report that we have achieved the twin goals of 120 tons per hour of dry aggregates as well as a clean exhaust stack and very little fugitive dust around the plant.

We learned that large volume of air passing through the dryer as the oil is burned carries the high temperatures all the way to the charging end of the dryer. A negative pressure is created in the dryer which prevents the puffing out of dust at the front end of the dryer. I have

personally observed this condition in many dryers. It was certainly true of ours before we made the changes.

Generally, I entirely agree with Mr. Nevitt that we need to go back to the fundamentals on drying. But along with that some knowledge of dust control must be exercised if asphalt plants located in urban areas are to be allowed to operate.

Ronald O. White, President  
The American Asphalt  
Paving Company  
Chicago, Illinois

• To make the funds more quickly available for state and local highway and street improvements in Indiana, Governor Craig has urged the enactment next year of state legislation to provide for monthly, rather than quarterly, distribution of state motor vehicle tax receipts.

• Ground breaking for the \$280 million Indiana Turnpike into Chicago from the east was scheduled for September 21.

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• Making a centerline saw cut on one of the West Virginia turnpike paving contracts, using special equipment developed by Seals, Inc. Over 2,000,000 linear feet of sawing in all.

# Eleven Pavers Set Pace on West Virginia Turnpike

*1,577,000 square-yard concrete paving job is biggest demonstration to date of highway joint sawing techniques. This report reviews some of the design features and methods seen on the four paving contracts.*

## Roads and Streets STAFF REPORT

CONCRETE paving for the West Virginia Turnpike, begun and completed this past season south of Charleston, has been watched with keen interest for several reasons. The 88-mile road constitutes one of the largest recent additions to concrete road mileage. The slab design is noteworthy for the absence of steel and

the use of sawed joints throughout.

And the construction is another example of high-speed contractor performance.

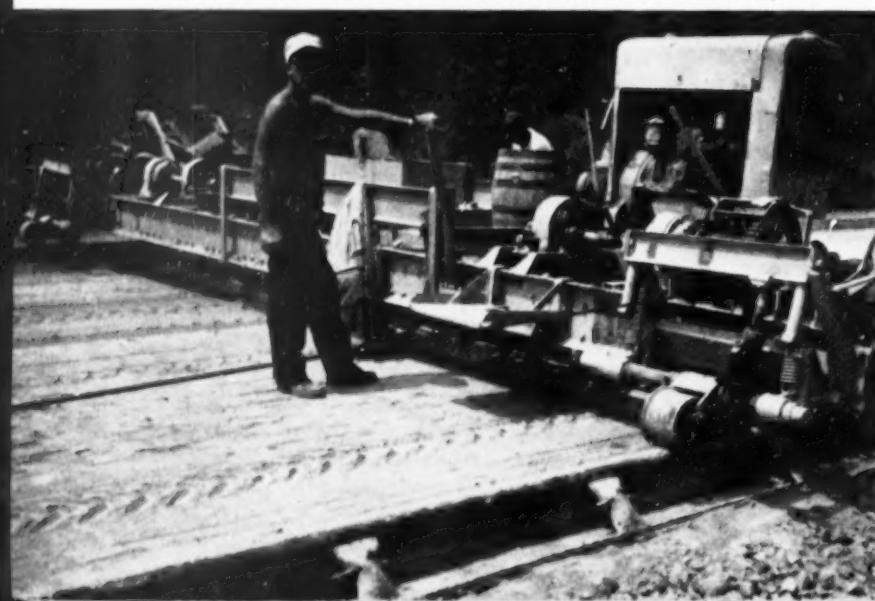
Base construction began in early spring on the southern end, paver operation following in May and June. Despite the fact that all four contract sections did not reach full swing until July, the entire 1,577,000 sq. yd. of paving, together with penetration shoulders and related work, was largely done by October in the midst of deck construction on 75 bridges. The southern end was opened on September 2, the rest of the road was set for late October.



● Subbase stone was spread on Contract 32 by two Jersey spreaders in echelon. This spreader drawn by D7 Caterpillar and followed by 50-ton compactor and motor grader.



- Huge stockpile of subbase stone, stored on the road grade, being loaded by Northwest and Lorain shovels for spreading, Contract 32.
- Spreading screenings for subgrade blanket on Contract 31. Machine is an RB subgrader equipped with a row of tamping shoes (seen by worker's feet).



While the turnpike is primarily a 2-lane highway it has 25 miles of creeper lanes for trucks, a 4-lane dual roadway for 6 miles near interchanges and population areas, and grade completed or nearly completed for future dualization of another 30 miles.

The pavement system designed for heaviest loads consists of a 14-in. crushed stone subbase, 1-in. sand or screenings cushion and 9-in. portland cement concrete pavement. The 2-lane pavement has 9-ft. shoulders and 3-lane sections have 2-ft. shoulders on the creeper lane side.

A feature of the design is the exceptionally heavy base (called "select subbase"), consisting of free draining, frost-resistant crushed materials designed for the rigors of the mountain climate and in anticipation of heavy coal and industrial truck traffic. Over three million tons of local sandstone was crushed during the 1953-54 winter (*ROADS AND STREETS*, April '54) and stockpiled to help the paving contractors get a speedy start. This stone is held to 5% of minus 200 material. It rests on a template grade which slopes 1% laterally from the centerline. The stone extends the full width of the grade, as a further assurance of a well drained subgrade.

#### "No Steel" Design

The 9-ft x 24-in. concrete pavement is designed without distributed reinforcement or expansion joints except at bridge ends. Transverse joints at 18-ft. intervals and centerline joints for 2-lane pours were required to be sawed; lane joints along adjacent third lanes are of keyed, tied construction.

Sawed transverse dummy joints were also required at specific positions over box culverts immediately under the pavement, to control cracking due to uneven settlement.

At bridge ends the pavement is reinforced, a typical design consisting of a 15-ft. panel resting on the abutment and heavily reinforced with  $\frac{3}{8}$ -in. bars in the axis direction; and one or two additional wire mesh reinforced panels each 75 to 80 ft. long depending on conditions. One-inch expansion joints are located at the bridge and between panels.

All paving and structural concrete for the turnpike is air entrained, the contractor having a choice of mill or job entrainment but preferring the latter for best control. Aggregate specifications were more rigid for paving than for appurtenances and structures, requiring imported limestone or Ohio River gravel aggregates. Some contractors elected to use paving concrete for curbs, medians and miscellaneous work as a practical economy.

#### Four Paving Contracts

The subbase, paving, shoulders and related work were awarded late in 1953 in four sections, as follows from south to north:

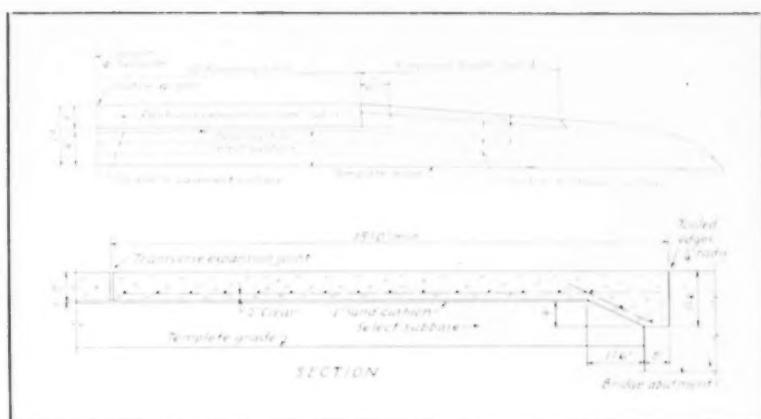
Contract 29 (mile 0.0 to 20.0). J. B. Michael & Co., Inc., of Memphis, Tenn.; C. E. Bain, superintendent. Concrete paving work performed by Southern Roadbuilders, Inc., of Augusta, Ga.; T. E. Wilson, superintendent. 370,000 sq. yd. of concrete paving. (\$5.83 per sq. yd.).

Contract 30 (mile 20.0 to 50.0). Nello L. Teer Co., Durham, N. C.; M. K. Moore, superintendent. Paving by Ballinger Paving Co., Greenville, S. C.; James Chandler, Jr., project manager. 572,000 sq. yd. of concrete. (\$5.45). Bituminous shoulders by Sam Finley, Inc., Roanoke, Va.

Contract 31 (mile 51.6 to 67.6). Bero Construction Corp., Hampton, Va.; Henry McDonald, general superintendent. 265,000 sq. yd. of concrete (\$5.45).

Contract 32 (mile 68.3 to 88.0). R. B. Tyler Co. & Breslin Construction Co., Louisville, Ky.; Harry Curlin, project manager. J. B. Michael & Co. and others performed much of paving work. 370,000 sq. yd. of concrete. (\$5.72).

Paving on these sections was done with 3, 3, 2 (later 3), and 2 34-E dual-drum pavers, respectively, or 11 pavers in all. Paver operation was delayed frequently by rain or wet subgrade during early summer, and by delays in grading principally on Contracts 31 and 32. The largest single day's run, up to September 7, was 2,790 ft. by Bero's 2-paver outfit. Best week's pour for a single contractor was 46,000 sq. yd. or 3.3 miles of 2-lane equivalent, by Southern Roadbuilders. Best combined week of six



● Standard cross-section of concrete pavement for the turnpike and longitudinal section of heavily reinforced slab at bridge ends.

days was 126,000 sq. yd. or 8.9 miles.

#### Some of the Methods

Following notes cover some of the design and specification details and points of construction interest on the various contracts.

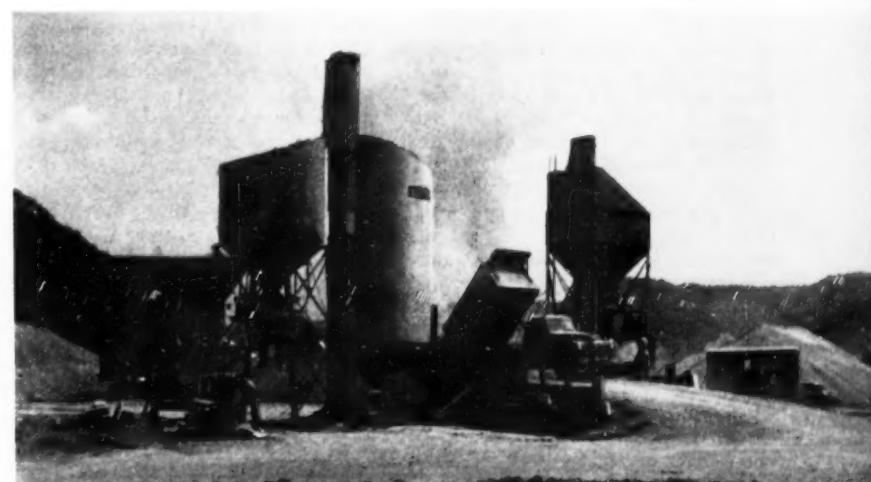
**Subbase.** Stockpiled crushed stone was hauled to the grade mostly by 10-wheel or semi-trailer dump trucks. On Contract 32 a 250,000-ton stockpile extending several hundred feet along the mountainside road shelf was moved first by the grading contractor's 4-yd. shovel and later by three 2-yd. shovels, working to a face as high as 30 ft.

Subbase stone was required to be placed and compacted in layers using mechanical or box spreaders. A typical procedure was to spread and roll 8-in., then 7-in. of loose material, followed by sufficient material to bring

the compacted stone to 14-in. thickness.

Density was not specified, but rolling was required "until there is no movement under the roller wheels." The contractor was required to have one truck-tire-type roller on hand for each 200 cu. yd. of loose stone placed per hour, or a heavy compactor for each 400 cu. yd. per hour. Stone was paid for on a tonnage basis, as measured by checking both the actual depth and specific gravity of the compacted subbase. Thus, the contractor had an incentive to compact well, and this fact together with the presence of adequate rolling equipment is credited by the engineers as the reason for the excellent base construction obtained. The contractors checked their tonnage by platform scales located near stockpiles.

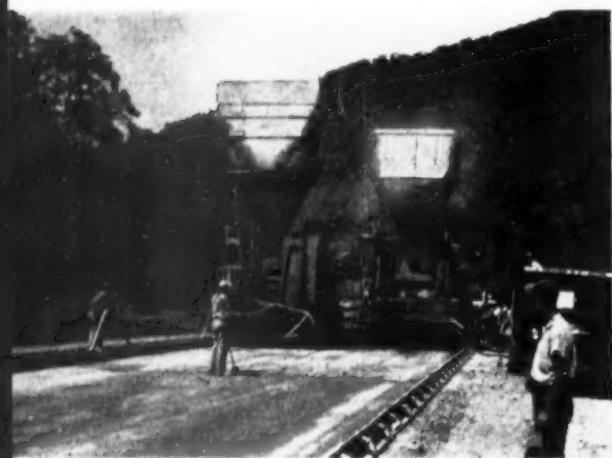
A typical stone spreading operation was the 10,000 to 20,000 ton per day



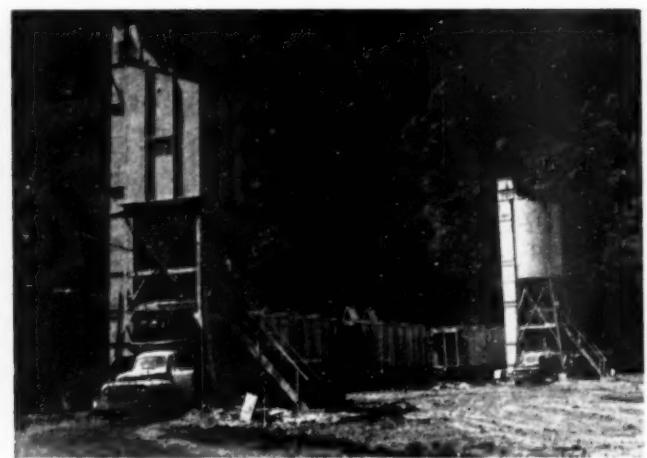
● Concrete batch plant for Contract 32. Butler cement bins on either side of dumping dock, and Butler silo. Large stockpiles of Ohio River gravel barged to this location on bank of Kanawha River.



● Contract 32 was paved with two complete one-paver outfits, each including a Koehring 34-E dual-drum paver, Blaw-Knox spreader, a finisher, a Koehring float and a Flexplane curing spray machine with mechanical broom. Not pictured: Worthington pavers used on Contract 29 and Koehrings on 30.



● (Left) Three of the four outfits used two pavers side-by-side between forms. A Koehring and Rex paired up on Contract 31. (Right) Two Blaw-Knox cement docks, each with screw-type unloading conveyors and elevators, were used to speed batching on Contract 31. Two additional truck stops for aggregates located back of camera to left.



schedule seen on Contract 32. A Caterpillar 12 grader shaped the template grade. Stone was spread by two Jersey spreaders traveling in parallel, one mounted on a Caterpillar D7 dozer frame and one on a Gar-Wood dozer frame on an Allis-Chalmers HD-20 tractor. A 50-ton Ferguson compactor with D8 Caterpillar tractor followed closely, making short back-and-forward passes to cover all stone with three round trips. A No. 12 grader trimmed each lift as it was rolled, and a Tampa pneumatic roller with International tractor finished out the top lift.

**Subgrade Blanket.** The blanket material was placed between the forms, bladed, struck off by tractor-towed "grade log" or a mechanical subgrader, sprinkled and rolled. The final strike-off was done with a second "grade log" dragged immediately behind a paver.

The blanket was specified to extend 15 in. beyond pavement edges. The

chief concern of the engineers in originally specifying this detail (see cross section) was to insure good bedding of the forms. Actually most contractors scalped through the blanket to set 10-in. forms for the 9-in. pavement, finding satisfactory form support directly on the very dense subgrade.

Some contractors elected to use rock screenings. Others used both screenings and concrete sand. The most effective blanket placement in the consultant's opinion was that done by an RB subgrader on Contract 31. This unit was equipped with a row of mechanical tamping shoes ahead of the screed. A well rolled, smooth blanket layer was desired to enable the pavement to "creep" uniformly subsequent to controlled crack development, so that cracks will tend to open up uniformly.

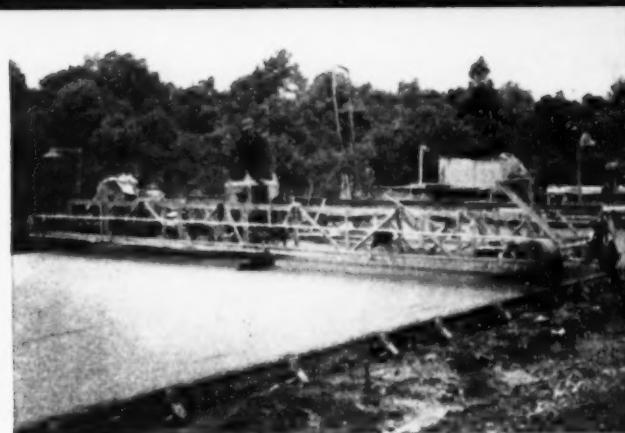
**Concrete Mix.** A 6-bag mix with 1 to 2 in. slump was used. Infrequent tendency for concrete to slip out or

warp during fast paver progress on grades was met by slightly reducing the slump or sand content, or both.

Gradation limits were specified for each of two course aggregates (No. 4 to  $\frac{3}{4}$ -in., and  $\frac{3}{4}$ -in. to  $1\frac{1}{2}$ -in.) and also for the two aggregates in combination. Since some contractors worked from very large stockpiles, special attention was given to avoidance of segregation; piles were required to be built up in layers.

**Batching.** Batch plants were located along the road for Contracts 29 and 30, along a rail siding for Contract 31, and along the Kanawha River for Contract 32.

A local quarry supplied stone for Contract 29 with a 15-mile haul. Stone required a 75-mile rail haul on Contracts 30 and 31. Sand was rail hauled from Petersburg, Va., for Contracts 29 and 30. Sand and gravel were barged on the Ohio and Kanawha rivers 75 miles for northern contracts 31 and 32. Aggregate trans-



• Belt and burlap drag, seen here on Contract 32. (Right): Brooming was done mechanically on most sections, using a broom fastened to a belt on the front of a curing spray machine.



• (Left): How one contractor drilled 150 ft. for mix water — with a creek only 50 ft. away! Reda submersible electric well pump used to supply 3,000-gal. gravity tank. (Right): Dorsey trailer with Mack truck taking on a roller the easy way (Contract 29).

port and handling hence were larger cost factors here than for the average highway job. The abundant but highly variable local sandstone was ruled out as a concrete stone because of a history of durability and control problems connected with these highly absorptive aggregates.

#### Pavers Between Forms

*Paver Operation.* Because of the prevailing narrow 2-lane grade and mountain conditions, all contractors found it expedient to run their pavers between the forms for main traffic lanes. All made 24-ft. pours, three using two pavers side-by-side and one (Contract 32) employing two complete one-paver organizations. Creeper lanes, interchange ramps and widening for service areas and toll plazas were paved by a third or at least a separate paver. On Contract 29, for example, two pavers placed 24 ft. of concrete through the entire job, the third paver handled the rest.

Paver overload of 10% normally allowed was reduced by the engineers on some of the steeper grades.

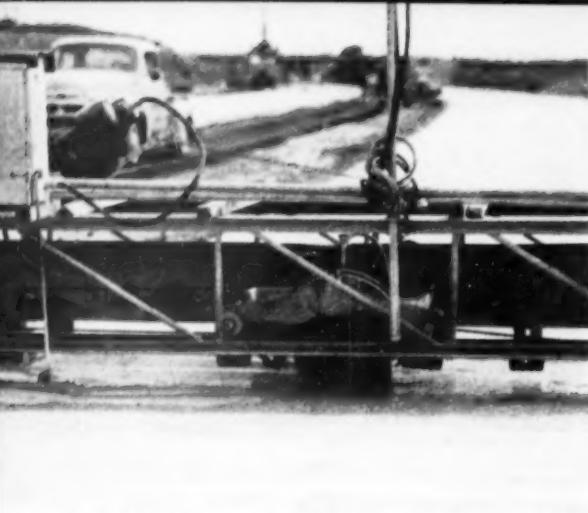
*Water.* While the turnpike follows various streams much of the way, in several instances the contractors had to drill deep wells and install pumps to supply mix water, due to high organic content of surface water.

*Spreading and Finishing.* The prevailing equipment train for two pavers consisted of one spreader, one

(or two) transverse finishers, a longitudinal float finisher, long handled straight-edgers and other hand tools, and the curing spray machine. Both belting and transverse brooming were required, the latter usually being done mechanically by a broom mounted on a power belt on the curing machine. Brooming when done mechanically was spot checked by a straightedge to see that no "built in" washboard effect was created by a worn or clogged

#### Paver Pace on the West Virginia Turnpike

Week of	Contract 29 (Sq. Yd.)	Contract 30 (Sq. Yd.)	Contract 31 (Sq. Yd.)	Contract 32 (Sq. Yd.)	TOTAL (Sq. Yd.)
July 10-17	46,000	43,000	9,500	23,000	121,500
July 17-24	23,000	24,000	3,000	27,000	77,000
July 24-Aug. 1	42,000	36,000	19,000	29,000	126,000
Aug. 1-7	26,000	31,000	3,000	15,000	75,000
Aug. 7-14	2,000	42,000	28,000	17,000	88,000
Aug. 14-21	Done	34,000	31,000	12,000	77,000
Aug. 21-28	Done	26,000	27,500	29,000	82,500
Aug. 28-Sept. 4	Done	Done	31,500	25,000	56,500
Eight Week Total	139,000	236,000	152,500	177,000	704,000



• Additional views of one of the special saw units furnished by Seals, Inc.

## Some of the Joint Sawing Methods, Equipment

ged broom or uneven broom pressure.

**Curing.** Curing cover was a white pigmented liquid membrane compound, placed mechanically. No compound was allowed to enter a saw-cut joint prior to sealing, this problem coming up specially in paving creeper lanes adjacent to completed slab.

Curing cover was required for the sawed joints. One contractor made up a reel of  $\frac{3}{4}$ -in. cord of twisted paper which was laid in the top of the joints to seal off the air. Others covered the joints after sawing with strips of paper weighted down by dirt.

### Joint Sawing Methods

**Sawing.** Joint sawing on Sections 29, 30 and 31 was turned over to

Seals, Inc., contractors, of Baltimore. This specialist organization has developed a machine which saws both transverse and centerline joints at costs claimed to be less than the cost of formed joints. Three such machines were used on the various contract sections. Mounted on rubber-tired, flanged wheels for riding the forms or adjacent slab, the unit has two 14-in. transverse saws powered by two 10-hp. electric motors and guided on a special track.

The centerline cut was made typically by two saws with two motors mounted on a rubber-tire-supported dolly extending back from the main frame. After completing a transverse saw cut, the operator lifted the saws, set a propelling gear, and made a

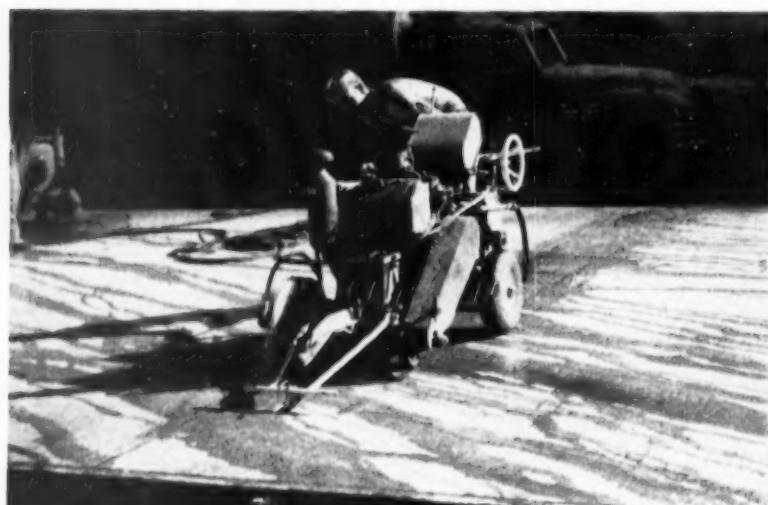
centerline cut to the point of the next transverse joint, where the cycle was repeated. All cuts by these machines are  $\frac{1}{8}$  in. wide.

Power for sawing was provided for each machine by a 25-kw. diesel generator mounted on a 2-ton truck which carried a 600-gal. water tank and electric pump for feeding water to the saws. The generator also supplied three 500-watt flood lights mounted on the frame of the saw rig — an important adjunct, since much of the sawing has taken place at night. This lighting arrangement according to the engineers and the operators has insured full efficiency and accuracy for after-dark work.

As reported by Wm. F. Middlestadt, president of Seals, Inc., a typical top day's pour of nearly 2,800 ft. of 24-ft. slab on Contract 30, involving 6,500 ft. of joint sawing, required the sawing to begin at noon and continue through until 6 A.M. This day-night run cost \$3.30 for diesel fuel, 18 man-hours of skilled operator time and 18 man-hours of unskilled helper time.

This machine has produced accurate joints and has won the enthusiastic approval of the turnpike engineers and contractors. On one contract, 20 miles of pavement was sawed with only five uncontrolled cracks.

Seals, Inc., has used special silicon carbide abrasive type blades furnished on an experimental basis by Cardinal Engineering Co., Philadelphia, Pa. Seals engineers have tried over 60 different formula blades and at this writing were unable to report accurate cost and durability data for any particular type. However, according to Mr. Middlestadt, his firm has averag-



• Felker saw in use on Contract 32, where hard gravel aggregate with rounded particles created difficulties.



• Two methods of covering saw cuts during curing period — Weighted paper, and rolled-paper string embedded in joint.



## and Results as Seen on the Turnpike Contracts

ed 350 to 400 ft. per blade where limestone has been the prevailing coarse aggregate.

The concrete paving aggregates on Contracts 29, 30 and 31 consisted of various combinations of silica sand, imported limestone and a local stone called blue limestone which contains various amounts of quartz and some other hard materials. Ohio river gravel was used on Contract 32.

On Contract 32 sawing was done by Kahlman Flooring Co. of Houston, Texas. Each one-paver operation was followed by hand-propelled sawing units, in one case by two or three hand-propelled Clipper and Felker saws, the other by two Clipper saws. Target brand carborundum blades were used for transverse joints, which were reported to be averaging 100 to 120 ft. per blade in concrete having gravel aggregate. Felker and Clipper diamond blades have been used on the centerline, which is not cut until early the next day, with footages of 1100 to 1200 ft. reported per blade.

On the subject of sawing, C. H. Peterson of Howard, Needles, Tammen & Bergendoff, the general consultants, has two emphatic conclusions based on the season's intensive experience. Pertaining, of course, to the weather, aggregate and other conditions encountered on this turnpike, these are:

(1) All joints should be cut as early as possible, even if slight raveling of edges occurs. Close cooperation by contractors and engineers is necessary to get the cutting done fast. This is the only way to eliminate uncontrolled cracking. This means within six, five or even four hours in hot weather,

and within eight to ten hours in cool weather or late in the season.

(2) Sawing should not stop even in the rain. The only time when any serious uncontrolled cracking involving limestone aggregates has occurred on the West Virginia Turnpike, was on Contract 32 at points where an afternoon shower brought a sudden cooling of the freshly set up concrete, coupled at times by delays in sawing. Sawing equipment hence should be designed

with a canopy, or other means taken to shelter men and mechanism so that no weather stoppage takes place.

### Some Sawing Difficulties

While excellent crack control was achieved in the 72 miles paved with limestone aggregates, the Ohio River gravel on the northern sections gave considerable trouble. The sawing contractor experienced difficulty in sawing early because of the greater ten-



• Mechanical brush used to clean joint prior to sealing (Contract 30). Sealing in progress (Contract 31).



• Sealz Melter for sealing materials, towed by Le Roi Tractair which also furnished air for blowing dust out of joints.



● A long grade on the completed turnpike. Creeper lane, separated by 4-ft. penetration shoulder, will eventually form part of complete dualization.

dency of the rounded aggregate particles to break out. Delayed sawing not only led to considerable wild cracking but further increased the blade costs.

Treatment for wild cracks consisted of removing and replacing sections of slab, widening and sealing the crack, or in some cases leaving fine cracks without immediate corrective action.

Some of the turnpike engineers feel, on the subject of sawed joints in general, that the lip or shelf cut, originally

specified, should have been left in the specifications. This detail they feel would insure more complete filling of the joint and a better seal if and when the joint opens up.

*Joint Sealing.* Hot poured rubber asphalt compound was used for joint sealing, under a specification requiring that joints be at least 60% filled. Seals, Inc., which performed sealing on the three southern contracts, filled the joints about three days behind the sawing. Their equipment consist-

ed of a small brushing device built by Middlestadt Machine Co., a companion firm, a LeRoi Tractair for blowing out joints, this tractor being used also to tow a Sealz melter. Sealing material was placed using two lightweight, wheel-type pouring carts, also made by Middlestadt, one for the first pour and one following to bring the pour flush after cooling and shrinkage.

A spokesman for the general consultants said that while good success was achieved in filling the narrow sawed joints, he feels that specifications for future concrete pavement should require a pressure applicator equipped with a narrow or flattened nozzle and a recirculating valve to insure full temperature of application.

#### Acknowledgements

Ray Cavendish is chief engineer and Okey L. Patteson, general manager of the West Virginia Turnpike Commission. Howard, Needles, Tammen & Bergendoff are general consultants in over-all charge. Section engineers consisting of Capitol Engineering Co., Dillsburg, Pa.; Fay Spofford & Thorndike, Boston, Mass.; and Gannett, Fleming Corddry & Carpenter, Inc., Harrisburg, Pa., prepared construction plans and supervised layout and construction for the paving here described.

- Typical method of striking off sand blanket on turnpike — "grade log" towed by front-end loader.
- One of scores of house trailers used by the turnpike contractors. Southern Roadbuilders, Inc., field office (Contract 29). Mast is for Motorola radiotelephone.

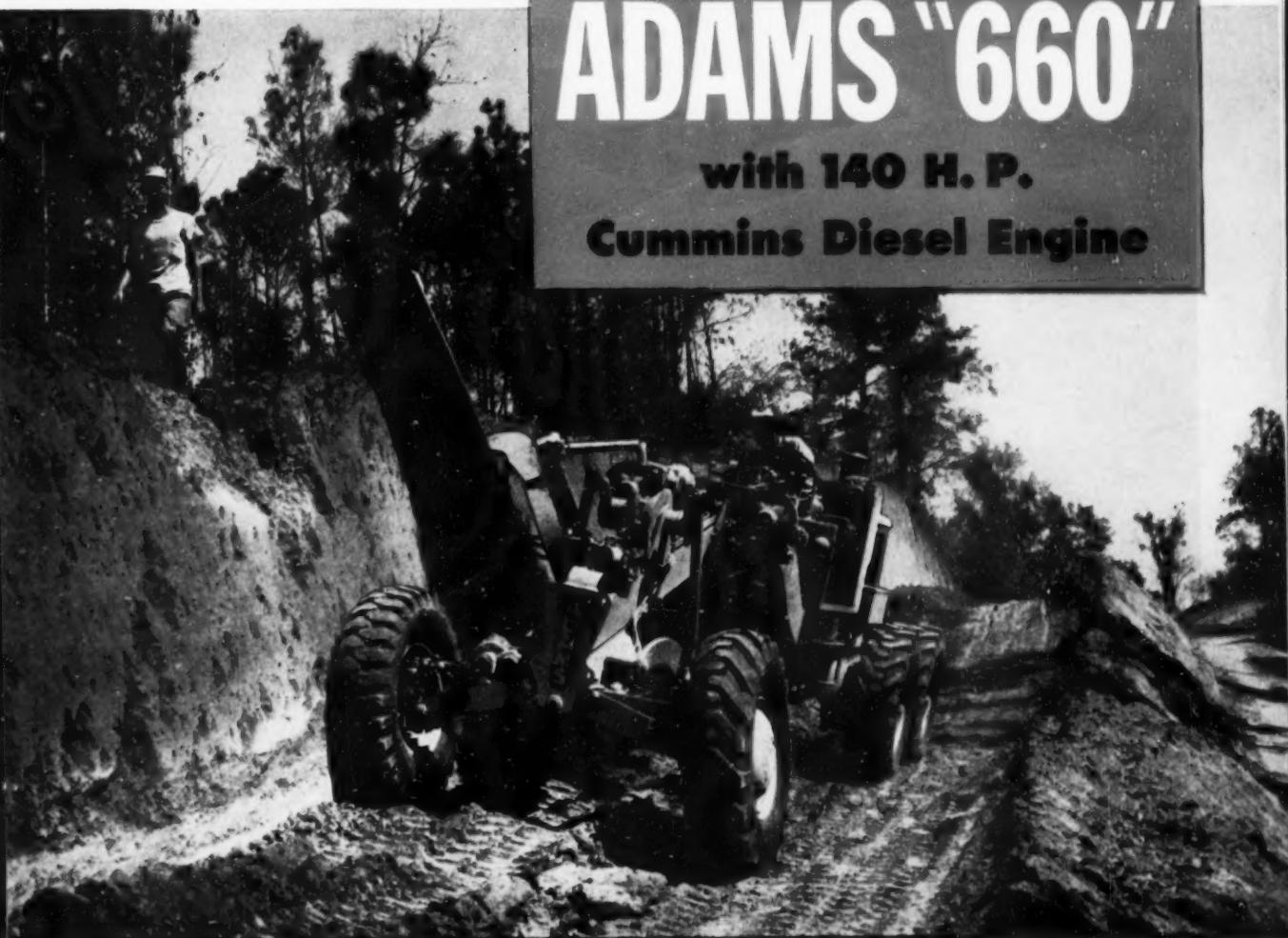


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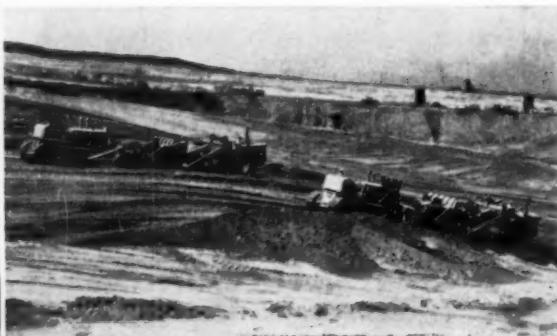
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### Compaction Roller of Unusual Design

The Buffalo-Springfield Roller Co., Springfield, O., has announced a completely new and revolutionary compaction roller, whose unusual design is claimed to provide faster, better, and more uniform compaction of various kinds of materials. This new machine, known as the K-45 Buffalo-Springfield Kompactor, has four large diameter rolls, made of heavy welded steel segments placed in staggered rows around each roll. Designed, engineered, and built to operate on an entirely new principle of maximum compaction with-



K-45 Buffalo-Springfield Kompactor

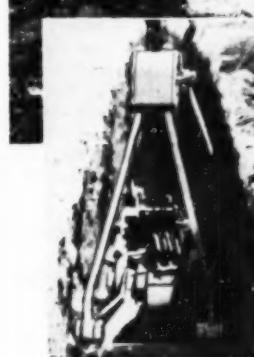
out forward pressure, the new Buffalo-Springfield Kompactor is stated to compact more efficiently because the unique segments which form the rolling surfaces enter the loose material with minimum displacement either forward or horizontally, and leave without disturbing the compacted areas in any way. Thus, all compaction effort is downward, resulting in greater and more uniform densities, from the lower elevations to the top surfaces. Density requirements are stated to be easily met or exceeded, in considerably fewer passes. The Kompacter is self-propelled, reversible, and easy to maneuver on steep embankments and can work in close to abutments and culverts.

### New Type Snow Fence

A new type of snow fence has been announced by Wrought Washer Mfg. Co., 2249 South Bay St., Milwaukee 7, Wis. The fence consists of three or four perforated steel panels, hung in tiers from fence posts, and attached with ordinary wire bag-ties. The multiple perforations in the steel panels, arranged in a series of waves or corrugations, cause the snow to settle in drifts parallel to the fence. Panels are made of heavy gauge steel, hot galvanized after fabrication.

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### Special Purpose Batch Body

A new special purpose batch body announced by Galion All-steel Body Co., Galion, O., is designed for delivering measured quantities of cement and aggregate to concrete mixers on highway construction projects. The new body is divided into 4 aggregate compartments by waterproofing batch boxes. Hinged covers on the boxes keep cement dry during inclement weather. Likewise, a full-width hinged bottom plate on each box is said to assure even distribution of cement over the aggregate during



Model 12N-7 Batch Body

discharge. Boxes are easily removable to permit use of the dump body for material stockpiling. Mounted on a Model 880 hoist, the 11 cu. ft. Model 12N-7 batch body shown has a capacity of 54 cu. ft. in each aggregate compartment and 18.6 cu. ft. in each cement batch box. Model 12N-5 batch bodies are also available in 9 to 11 cu. yd. capacities.

### New Bucyrus-Erie 3-Yd. Shovel

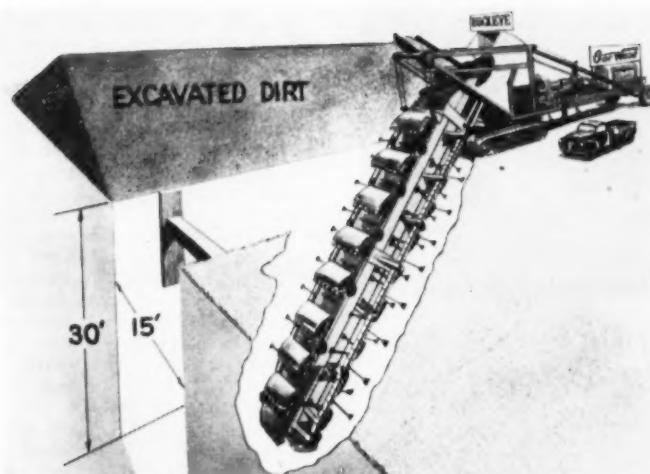
A new 3-cu. yd. shovel — readily convertible to dragline, clamshell or lifting crane — has been developed by Bucyrus Erie Co., South Milwaukee, Wis., to complement its line of individually designed crane-excavators. In filling a gap between Bucyrus-Erie Models 54-B and 88-B (2½ and 4 yd. capacity respectively), the new Model 71-B incorporates the basic engineering features and field-proved advantages of the company's current line of general purpose excavators. The major features



Model 71-B 3 cu. yd. Shovel

include: positive twin rope crowd with rectangular inside dipper handle; strong light boom; fully independent boom hoist; full air control (not just air assist) except for drum brakes and swing and propel jaw clutches, torque converter drive (also available without torque converter); one-piece cast steel revolving frame; choice of four A-frames; 12 conical hook rollers; four optional crawler mountings, and steering clutches and friction digging brakes spring set and air released. The 71-B is powered by a 6-cylinder GM diesel engine equipped with Torcon torque converter. An air controlled, disc-type power take-off clutch connects engine to its power take-off shaft, and drive is delivered to horizontal transmission shaft by means of a four strand roller chain, adjusted simply by sliding the main engine on its base with two built-in jacks. The engine governor is manually controlled through an armored flexible push-pull cable.

### World's Largest Ditcher



Mole's eye view of the new giant dumper.

The largest ditching machine in the world, capable of digging a ditch 15 ft. wide and 30 ft. deep, is being designed by Gar Wood Industries.

The new dumper, Model 435, will be used to excavate intercepting and outfall sewer trenches, water diversion aqueducts and other large ditches. It will sell for about \$100,000, or 50% less than the cost of conventional excavating equipment now used for such

work.

The machine will be crawler mounted at the digging end and supported by rubber tired wheels in front. Two diesel engines with torque converters will supply power to the crawlers and the digging drive. Hydraulic power steering will be another feature.

Contractors interested can secure more information on the dumper by writing Gar Wood Industries, Wayne, Mich.

### Extra-Heavy-Duty 6-Wheel Truck

A new, extra-heavy-duty, six-wheel truck model, the International RF-230, specially designed for off-highway service, has been placed in production by the motor truck division of International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill. The new model, with gross vehicle weight rating of 60,000 lb., is powered by the new 201 HP International RD-501 engine, which delivers 430 lb. ft. torque at 1600 rpm. All components of the RF-230 model have been carefully coordinated with the RD-501 engine to assure outstanding performance, economical operation, minimum maintenance, and long service life. This model is designed for 8 or 9-yd. concrete mixers, or for service in stripping operations, highway and dam construction, earth-moving operations, quarry work, and the like. It is built to absorb severe shock loads.

The International RF-230 is stated to have the power required to haul 60,000 lb. GVW over the roughest type of terrain on off-highway projects, and also the ability to successfully move a heavy load over semi-improved or improved roads for long distances at maximum safe speeds. Equipment includes hydraulic, full-power steering; air brakes; 15,000-lb. front axle; 46,000-lb. rear bogie; 12-volt electrical system; 60-gal., right-side, step-type fuel tank; and 15-in. clutch. Standard wheelbase is 175 in.

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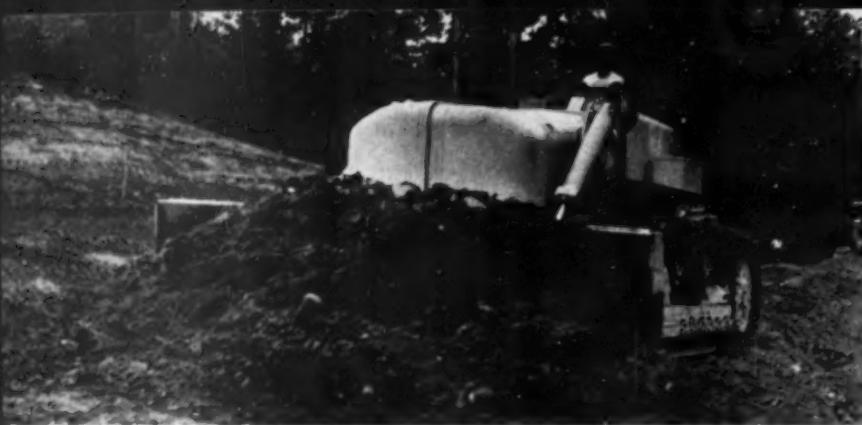
Let us tell you of our success in sawing and sealing the joints on the major portion of the West Virginia Turnpike, where we have performed all joint cutting for three contract sections totaling over one million square yards of pavement.

Write, wire or phone for details before you plan your 1955 paving operations or estimate your next job.



Seals, Incorporated equipment seen on West Virginia Turnpike — Performance highly praised by consulting engineers.

**Seals, Incorporated,** Wm. F. Middlestadt, President  
Tel: Chesapeake 3-3094      4040 The Alameda      Baltimore 18, Md.



● Euclid TC-12 twin crawler with 13½-ft. dozer blade.

## Euclid Previews Twin Tractor

*Also unveils three 2-axle scrapers*

The Euclid Division of General Motors has entered the crawler tractor market with a new twin-engine machine of revolutionary design. The Model TC-12 Twin Crawler is the first of a projected line of tractors for earth moving, open pit mining, logging, and industrial applications.

Unveiled at a press preview at the Milford (Mich.) G.M. proving grounds, the tractor will undergo a period of field service and further testing before being offered to buyers some time in 1955.

The tractor is powered by two 190 hp GM diesel 6-cyl. engines, each driving an Allison Torque Converter and Allison Torqmatic Transmission. Each drive train independently powers one track. Final drive gearing is the same job-proven Euclid planetary used in off-highway 50-ton dump trucks and the 25-yard bottom-dumps.

Two separate drive and track assemblies are free to oscillate on a 7-in. transverse shaft. The machine can be separated into two halves for shipment where weight and width restrictions are encountered. The two-section design also gives flexibility over uneven ground. The

tracks maintain good traction because each half of the tractor maintains better ground contact in rough terrain. A free movement of seven inches is limited by stops welded to each frame half. For applications where oscillation is not desirable, some of the tractors will be field tested with rigid mounting on the cross shaft.

The Twin-power principle is a Euclid development resulting from demands for more power and greater earth moving ability. Twin-power drive from two engines has been used in Euclid 34-ton and 50-ton rear-dump trucks, Twin-power 18-yr. scrapers, and bottom-dumps where each engine drives through a converter and transmission to a drive axle.

The use of paired components results in an earthmover which is said to give lower cost per yard of earth moved because — (1) it utilizes high volume, lower cost assemblies used in other smaller sizes of earthmoving machines; (2) parts supply and parts cost are favorable, and (3) components are matched to power output of engine, without necessity of

developing a completely new power train for new, larger tractors.

By using two engines and two transmissions in larger tractors, and single engines with single transmission in smaller tractors, it is possible to have two models with similar power trains.

The result of intensive study of crawler tractor requirements, the Euclid TC-12 experimental tractor is designed to provide higher power-to-weight ratios. Drawbar pull, equal to (or better than) current production crawlers, but at higher ground speeds, is said to give tractor ability for faster pusher loading of rubber-tired scrapers. Proving ground tests indicate the Euclid TC-12 develops approximately twice the drawbar pull at 2 mph. scraper loading speeds, compared to present "big tractors." This loading speed matches the first gear speed of rubber-tired scrapers, for better, more efficient scraper loading.

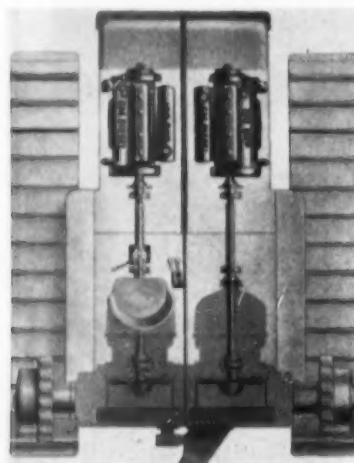
The Twin-power arrangement permits a fast, flexible steering system, which increases workability. The tractor can be steered in several ways: by increasing or decreasing the speed of one engine for gradual change in direction; by putting one transmission in neutral and applying a track brake; or rapid, sharp turns under full power can be made by putting one transmission in forward and the other transmission in reverse. The choice assists in shortening cycle time.

### Three New Scrapers

Three new Euclid scrapers were also demonstrated at Milford for the press and for Euclid's world-wide distributor organization to be manufactured in limited quantities this year. These units which embody many profit-making factors, are:

Euclid S-7, a seven-yr. struck capacity, overhung engine unit powered with 138 hp General Motors diesel engine.

Euclid S-18, an 18-yr. overhung machine with 300 hp GM diesel engine used in conjunction with an Allison Torqmatic Converter and Transmission.



● Euclid TC-12 "twin principle" dia-grammed.

### TC-12 Specifications

HORSEPOWER:	380 — Two GM Model 6-71 Diesel engines.
WEIGHT:	53,000 lbs. Approximate Bare: 65,000 lbs. with Bulldozer and other attachments.
DRAWBAR PULL:	Maximum drawbar pull almost equal to tractor weight with working accessories.
TRAVEL SPEED:	0 to 8 miles per hour, with three speeds.
ENGINE:	2 Detroit Diesel Model 6-71 — 190 HP each.
FUEL:	General Motors Detroit Diesel Fuel Specifications.
STARTING METHOD:	Electrical Starting.
TRACK:	39 shoes each side; 26-in. standard shoe width; 2½ in. grouser height; 115% in. tracklength on ground; 6,000 sq. in. ground contact area of shoes.
TRANSMISSION:	Two Allison Torqmatic Drives, CRT-5530.
STEERING:	With engines, transmissions and brakes.
CLUTCH:	None required.
GENERAL DIMENSIONS:	
Length (Overall)	15 ft.
Width (Overall)	11 ft. 4 in.
Height (Exclusive of the exhaust stacks)	8 ft.
Ground Pressure	8½ lbs. per sq. in. bare



● Euclid TS-18 improved twin engine

The TS-18, improved experimental overhung twin engine unit of 18-yr. capacity, powered by two 190 hp GM diesel engines — one in the tractor and the other located behind the scraper bowl driving the rear wheels. These engines also drive through Allison Torqmatic Converters and Transmissions.

For further information on the new Euclid tractors and scraper, address Euclid Division, General Motors Corporation, Cleveland 17, Ohio.

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HYDRAULIC  
BOOSTER STEERING

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steer a GALION  
MOTOR GRADER !*



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MOTOR GRADERS**

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As a result, GALION Motor Graders are easier and more efficiently maneuvered — operators stay fresh and alert all day long — performance is boosted all around. Hydraulic booster steering has for years been STANDARD EQUIPMENT on the larger models of Galion Graders. Write for literature.



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Cable address: GALIONIRON, Galion, Ohio

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*Para Plastic*

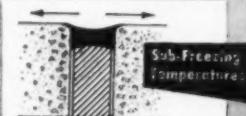
- Para-Plastic keeps joints sealed under severest conditions of traffic, temperature
- May be pumped directly into joint from melting kettle
- Para-Plastic "JF" compound impervious to Jet Fuel or petroleum solvents used in aircraft

Use Hot Poured Para-Plastic . . . field-proved to be the only effective method of sealing joints with a high degree of permanence. There's no substitute for Para-Plastic . . . nothing equals its sealing performance. It's stable, constant in volume, won't break down and maintains bond under virtually every condition. Para-Plastic can now be pumped directly into the joint from the melting kettle—a fast, simple method of application. Write for details on new method and information on Para-Plastic and Para-Plastic JF.

The only FIELD PROVED METHOD OF SEALING JOINTS



Temperatures to 180° F do not affect Para-Plastic sealing efficiency.



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## WISCONSIN-POWERED COMPRESSOR

Supplying dependable AIR-COOLED power for this P244 GH Ingersoll-Rand Air Compressor for operating a J-10 Jackhammer, engaged here in drilling light standard hole in a bridge pier, is a typical assignment for Wisconsin Engines.

Wisconsin heavy-duty engineered design and construction, plus dependable AIR-COOLING and ready adaptability to installation on practically any type of equipment requiring power components from 3 to 36 hp. are factors that make Wisconsin Engines the preferred power among both original equipment manufacturers and purchase-for-use customers.

You can't do better than to specify "Wisconsin Power" for your equipment. Descriptive and engineering data gladly supplied.



**WISCONSIN MOTOR CORPORATION**

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

## Pettibone Wood Preparizer Has New Engine

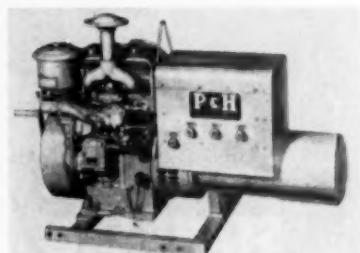
AGMC671 diesel is the new power plant on the Pettibone Wood Model P-600 Preparizer. This engine is equipped with a Fuller 4-speed transmission which gives variable speeds to the rotor shaft,



Model P-600 Preparizer

thereby providing a range of power to handle any pulverizing job. The Preparizer also features a new breaker bar for faster breaking of hard asphaltic materials. New longer lasting drive-on paddle plates are being used and the number has been reduced from 48 to 24. Literature on the P-600 Preparizer may be had by writing to Pettibone Wood Mfg. Co., P. O. Box 620, 6900 Tujunga Ave., North Hollywood, Calif.

## Arc Welder of New Design



P&H Model WN-150 Welder

A new gasoline engine driven arc welder is now in volume production by Harnischfeger Corporation, 4601 W. National Ave., Milwaukee 46, Wis. Of entirely new design, the Model WN-150 combines extremely small, compact size with generous output. Power is supplied by a 2-cylinder, air-cooled gasoline engine close coupled to the P&H-built welding generator. Control has been simplified by the use of plug-in stations and by a variable-speed engine which covers the full heat range. Capacity is 20 to 200 amperes. Weight of the Model WN-150 is 425 lb. and dimensions are: 45 in. overall, 20 in. in height. It is available with a handy two-wheel mounting.

## Hydro-Steer for Super C Tournapulls

A hydro-steer unit developed by Shep-herd Tractor & Equipment Co., Atlantic and Bandini Blvd., Los Angeles, Calif., is stated to make positive hydraulic control in steering automatic on LeTourneau Super C Tournapulls. This unit (designed for Super C Tournapulls), consisting of heavy-duty hydraulic rams mounted between the tractor and scraper, affords

positive directional control through two mono-directional hydraulic systems which permit change in ram position only when regular operator controls are actuated, and only in the desired direction. Completely self-contained and requiring no engine power, Shepherd hydro-steer will hold the Super C in a straight line regardless of wheel slippage, grade, over-pushing, or operator inattention. Full engine power for traction and full braking of both drive wheels become available under all conditions. Jackknifing and inadvertent control reversal are eliminated and machine capacity increased under adverse conditions. Safety in high-

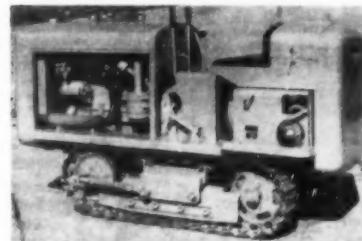


Hydro-Steer Unit on Tournapull

speed haul or highway transport operation is increased. Manufactured under pending patents by Shepherd Tractor & Equipment Co., the hydro-steer unit is available as an inexpensive, complete kit that can be easily installed with regular welding equipment.

#### Crawler Mounted Welder

To offset the difficulty of getting a welder to the place where it is needed, Schramm, Inc., West Chester, Pa., has mounted a 300 amp, gasoline engine driven welder in a self-propelled crawler. Power from the engine is transmitted to the tracks through a chain, a differential and final bull gear drive. Steering is accomplished by brakes on the drive wheels. This gives the ability to turn the machine on its own center, a real advantage when getting into inaccessible places. The total overall width is less than 32 in. Four forward and one reverse speed are provided. Electric starting is standard equipment.



Welder Mounted on Crawlers

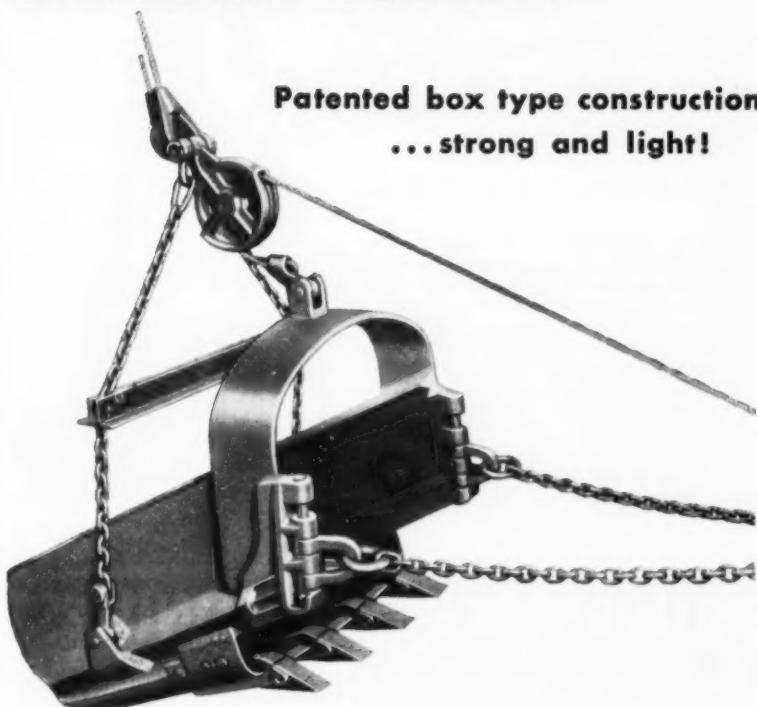
#### Pavement Cutting Machine

A new machine for cutting pavement has been announced by Windsor Machinery Corp., 61 Airport Road, Hartford, Conn. Powered by a 26.8 HP motor for fast cutting, the machine features the Windsor diamond blades in diameter

*Make more profits with*

## WELLMAN-WILLIAMS DRAGLINE BUCKETS

**Patented box type construction  
... strong and light!**



THE Wellman-Williams Dragline Bucket is perfectly balanced, light in weight, has a wide digging radius and hitch connections for fast adjustment of digging depths. Alloy steels provide maximum strength with minimum dead weight. Teeth are made of manganese steel and are reversible. Perforated type dragline buckets also available.

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2011

## PULL SPROCKETS IN MINUTES

WITH THE

NEW



SPROCKET  
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Portable OTC 50 Ton Hy-  
draulic Ram with Adapters  
Pulls or Installs on the Job  
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Pulling International  
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### Sets For Caterpillar, Allis-Chalmers and International Harvester

**Save Time, Labor—Reduce "Down-time."** Now for the first time the tough, time consuming, costly job of pulling industrial tractor sprockets can be done in minutes by one man with the new OTC 50 Ton Ram and adaptors. Sets are available for each make shown above or a Universal Set to fit all three makes . . . If you have a 50 Ton OTC Ram, you need only the adaptors. Three types of pumps are available . . . For complete information write your jobber or Owatonna Tool Co. giving make of tractor used.

Ask about OTC Hydraulic Universal Puller Sets too!



OTC 50 Ton POWER-TWIN Hydraulic Ram may be used for hundreds of tough pulling and installing jobs including the above.

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sizes of 12 to 22 in. A cooling and flushing system has been especially designed that instantly removes all loose abrasives in the cut. This is accomplished by water being carried down to both sides of the blade by twin steel tubes, where it is jetted into the blade collar. Through centrifugal action, the water is then picked up and forced through slanted holes, spaced at  $\frac{1}{8}$  in. intervals, onto the blade and into the cut. Other features of the Windsor concrete cutter are depth of cut control, durable welded metal frame, heavy front shaft that permits fast cutting, hydraulic system which balances the machine's 1000 lb. weight for easy maneuverability, heavy duty semi-pneumatic tires, 6 volt self-starting battery and a front pointer or guide which automatically maintains cutting position.



Windsor Pavement Cutting Machine

### Truck Chassis for Transit Mixers

A new double tandem type chassis added to the line of Dart Truck Co., 27th and Oak Sts., Kansas City 8, Mo., is designed to give increased transit-mixer haulage capacities. The new truck designated as Model 15-DT was designed for 54,000 lb. to 60,000 gross vehicle weight with front tandem axle loading of 24,000 lb. to 30,000 lb. The rear tandem loading is 28,000 lb. to 32,000 lb., depending upon the type of mixer and its location on the truck chassis. Powered by a 178 HP or 200 HP engine, the truck has a 5-speed main transmission and an auxiliary. A feature of the truck



Dart Model 15-DT

is its front tandem axle which is designed with rocker-type spring suspension and self-floating axles. Twin hydraulic cylinders provide finger-tip steering.

### Front End Loaders

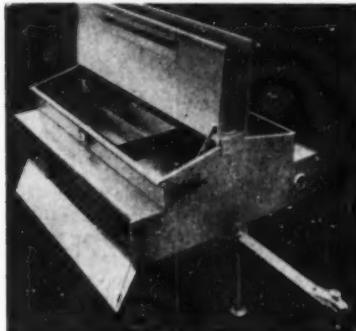
A new heavy duty industrial loader, designed for gasoline and diesel powered Fordson Major tractors, has been announced by Wagner Iron Works, 1905 So. 1st St., Milwaukee, Wis. Capable of handling 2,000 lb. lifts and  $\frac{5}{8}$ -yd. loads,

the new model W7-FM is powered by the Wagner independent hydraulic system with down pressure side cylinders and twin double-acting attachment control cylinders. Of step-in design, the unit features fast lift and quick dump combined with an unobstructed view of materials being handled.

The Wagner Iron Works also has announced a new medium-priced hydraulic loader, with 11 cu. ft. capacity and capable of live loads up to 1500 lb. The new unit known as model WMD5-SUPER is equipped with twin self-equalizing dump cylinders and down pressure side cylinders on the dipper-stick.

#### **Tamperproof All-Steel Tool Box**

A new tamperproof, pneumatic tired all-steel tool box, announced by Aeroil Products Co., Inc., 43 Wesley St., South Hackensack, N. J., features side compartments, internal sliding tray and front and rear drop legs with pads, all of which lock securely from the inside of the box. The wheels and tires too, lock fast from within, making the unit absolutely tamperproof. Two independent tumbler locks on the covers secure everything. This tool trailer carries up to 2,000 lb. of tools and equipment. Storage capacity including the four side compartments is 30% cu. ft. The box itself is mounted on Aeroil's Lo-Load chassis.



New Aeroil Portable Tool Box

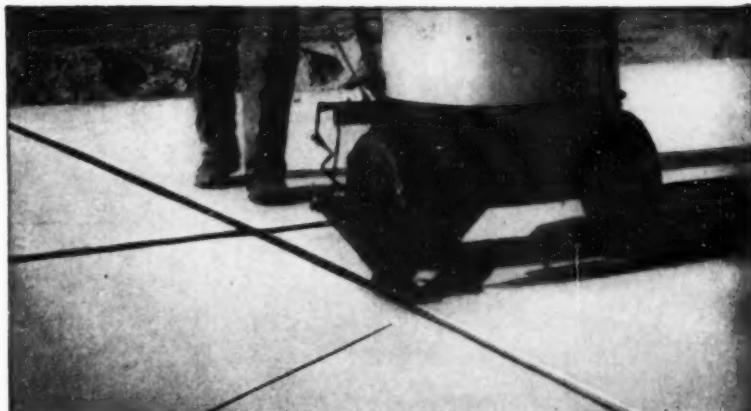
For flexibility and convenience the box may be unbolted from the chassis, leaving the chassis free for utility hauling, or allowing the box to be mounted on a pickup truck.

#### **Compacting Garbage Body**

A new low cost compacting garbage body, the M-B Packer Body, announced by the M-B Corporation, New Holstein, Wis., was specifically designed to provide maximum payload on a minimum size, low cost truck. This was achieved through a simplified compaction system



M-B Packer Body



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One application of dependable, durable FLINTSEAL\* is just what your joints in concrete pavements need . . . for years and years and years!

That's real service . . . real economy!

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Yet it stays flexible and resilient, too . . . bonds to joint walls perfectly.



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Both FLINTSEAL and FLINTSEAL JFR meet State and Federal specifications.

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Over 50 Years Specialized Experience At Your Service . . . by 'phone, mail or personal call. No obligation.

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Flintkote Co. of Canada, Ltd.—Toronto, Ontario

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Lay concrete **WITHOUT FORMS,**  
asphaltic concrete and all kinds  
of aggregate!

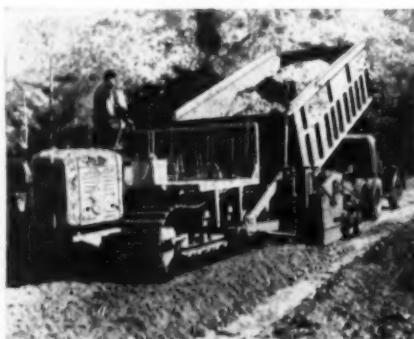


*Cut costs on your widening jobs*

ON A TEN MILE concrete strip, six feet wide, a Blaw-Knox Apsco Road Widener has saved over \$10,000! No forms are required with these time- and labor-saving units. The strike-off gate confines and distributes the concrete over the desired strip, then the independently powered vibrator "sets up" the concrete which is neatly shaped by the trailing shoe. The Blaw-Knox Apsco Widener handles up to 6-ft. widths at a rate of 150 tons per hour, spreading and finishing concrete up to 1½ miles a day. Handling dirt, gravel or stone, it builds shoulders at a 200 ton per hour clip. It's a heavy-duty money saver, available in two sizes for spreading up to 10' widths. Write for Bulletin 2458.

## BLAW-KNOX APSO BASE PAVERS

Big capacity Base Pavers, with plenty of traction and power, handle stone, slag, gravel, soil cement or road-mix aggregates to spread accurate base course with no segregation of material. Two sizes meet every requirement for fast, low-cost operation. Write for Bulletins 2457 and 2459.



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## BLAW-KNOX COMPANY BLAW-KNOX EQUIPMENT DIVISION

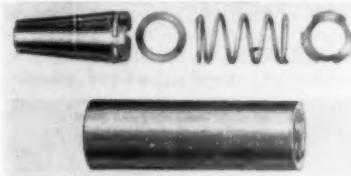
PITTSBURGH 38, PENNSYLVANIA  
Offices in Principal Cities



providing such thorough and complete compaction of the entire load that 14 to 16 yd. of compacted refuse can easily be handled on a small 2 ton or smaller truck. The body is a square shaped, van type, equipped with a packer plate, mechanically operated, which moves backward to progressively compress the load from top to bottom and side to side with each pass. As much as 2 cu. yd. can be easily compressed with one cycle.

### Gripping Chuck for Prestressed Concrete

A new reusable gripping chuck for end-anchoring wire, strand or rod in prestressed concrete construction has been announced by Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill. The gripping chuck consists of a heavy steel casing with an internal taper. The 3-jaw gripping chuck comprising several hundred sharp, wedge-shaped teeth which engage the wire automatically, a positioning spring, and necessary washers complete the assembly. It is stated the gripping chuck will hold the wire firmly under tensions as low as 300 lb. and anchors wire ranging from 150,000 to 290,000 psi. at 4,000 lb. to 20,000 lb. tension.



Steelcase Strandvice

### Front End Loader

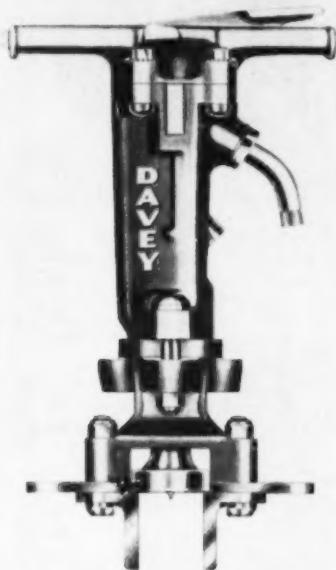
A new loader, GFT Model, added to the line of Lessmann Manufacturing Co., 20th and Easton Blvd., Des Moines, Ia., has front wheel drive and rear wheel steering. This design is offered to users who are confronted with operating in confined areas, flotation problems, etc. The patented Lessmann power crowd feature is used, which allows operator to fill bucket without forward movement of tractor. Four wheel brakes are standard equipment. These brakes will hold the tractor when bucket is being forced into hard material.



Lessmann Model GFT Loader

### Heavy-Duty Sheeting Driver

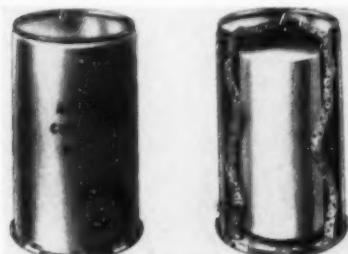
A new, heavy-duty sheeting driver, announced by Davey Compressor Co., Kent, O., is said to be highly effective for driving wooden sheeting in ground formations such as clay, sand, gravel, etc. It can also be employed for driving light steel piling. The driver consists of a Davey DB-90 paving breaker with an SD-90 sheeting driver attachment. Net weight of the DSD-90 driver is 125 lb. It is 28% in. long, 15% in. wide and has a 7 in. depth. The SD-90 attachment weighs 70 lb. Length is 12% in., width 14 in. and depth 7 in. The unit will handle sheeting of 2-2½-3 in. sizes. Driver can be assembled to position handles either in line or crosswise to the row.



Davey DSD-90 Sheeting Driver

### Curing Concrete Test Cylinders

A new and inexpensive method for curing concrete test cylinders in the field, under controlled humidity and temperature conditions has been developed by E. W. Zimmerman, 228 N. LaSalle St., Chicago 6, Ill. Under the new method, test cylinders are placed in a ruggedly constructed metal curing can, lined with a thick layer of DuPont cellulose sponge. This inner liner is the most important part of the curing can, since it permits



"Acme" Curing Can



Leschen engineers tell you how to determine ...

## Proper Use of Wire Rope with Wire Rope Core

**What is it?** It is a completely metallic rope made with a separate wire rope as a core, instead of the usual fiber core.

**Why is it used?** The steel core resists extreme pressure of individual strands on the core under very heavy loads. Here, a Red-Strand steel core rope substantially outlasts a fiber core rope. The extra steel in the core increases rope strength and safety by 7½%, compared with wire rope with fiber core. For occasional heavier loads this eliminates time and expense of changing sheaves, blocks and equipment to suit a bigger fiber core rope.

Red-Strand steel core rope answers the problem of crushing when rope is spooled in multiple layers on small diameter drums and winches—or when heavy loads are dragged or pulled. It also resists the damaging effects of excessive heat.

**Where is it used?** For extra strength and to resist heavy load pressure: on shovel and draglines—for drag, hoist, crowd and frequently boom ropes; on dredges, trench hoes, cranes and similar heavy duty equipment. To resist crushing: on bulldozers, scrapers, coal cutters, coal loaders, logging, arch and choker lines, and on rotary drilling lines. To resist excessive heat: on hot ladle cranes.

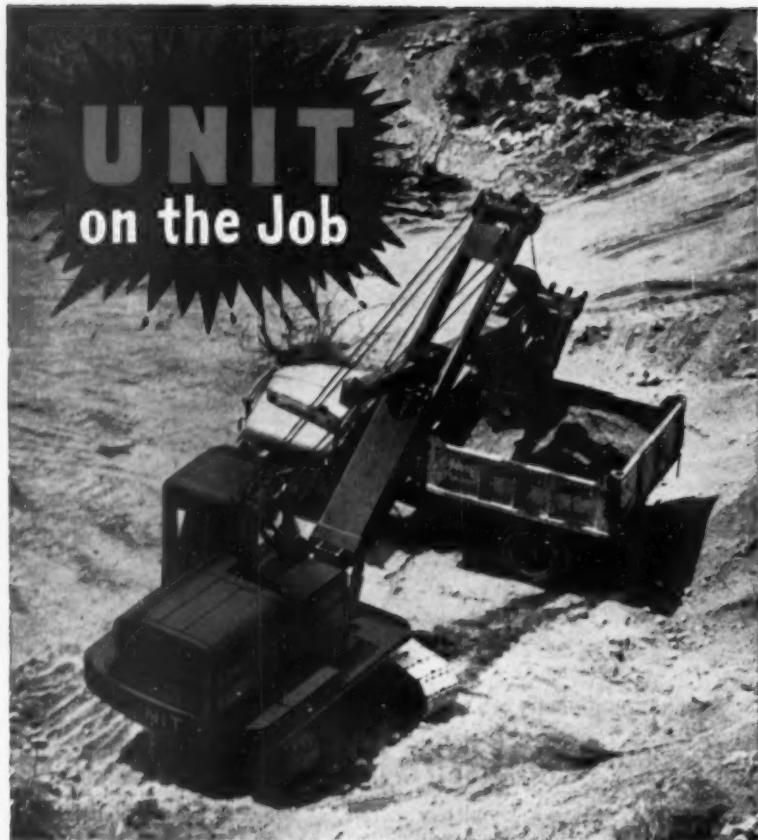
**Which make should you use?** Red-Strand steel core wire rope is highly recommended by its users for its higher-than-rated quality and longer-than-expected service. That saves money.

**What's the next step?** Talk to your Leschen distributor or Leschen field man. They're well qualified to answer your specific questions about Red-Strand steel core wire rope—or to help solve other wire rope problems.



Severe stress, pressure and crushing occur on rotary drilling drums, winches, shovels, draglines, logging lines, and others. Where tons of molten steel are to be lifted by wire rope, great strength and resistance to intense heat are required. Here Hercules Flattened Strand wire rope with wire rope core delivers much-longer-than-expected service.

Hercules Red-Strand wire rope made by  
**LESCHEN WIRE ROPE DIVISION**  
The Watson Stillman Company  
(A SUBSIDIARY OF H. K. PORTER COMPANY INC.)  
St. Louis 12, Missouri



## SWING SPEED makes PAY LOADS!

Here's a UNIT  $\frac{1}{2}$  Yard Shovel doing a PRODUCTION DIGGING JOB in a gravel pit. UNIT owners like the ease of operation and the FULL VISION CAB for complete visibility. They also like the sturdy construction and the many mechanical features, plus the ECONOMICAL PERFORMANCE and LOW UP-KEEP which all add up to EARNING POWER. Why not investigate what UNIT can do for you — on YOUR next excavating and material handling job?

**SEE FOR YOURSELF:** Let us send you our novel TV Brochure. It illustrates the complete UNIT line.

**UNIT CRANE & SHOVEL CORPORATION**  
6407 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



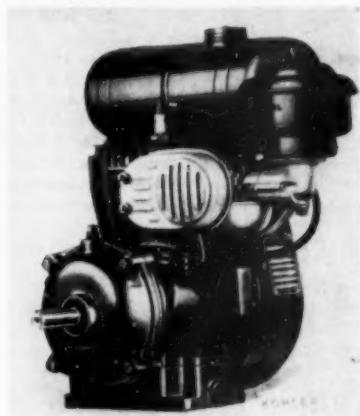
$\frac{1}{2}$  or  $\frac{3}{4}$  YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY  
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

the absorption of 2 to 4 qt. of water with a 60 per cent retention at seven days. The bottom of the can has a special gasket that insures a complete seal when the top is in place.

### 3.6 HP Air-Cooled Engine



Model K90R Air-Cooled Engine

A new Model K90R has been added to the air-cooled engine line of Kohler Co., Kohler, Wis. The engine is equipped with a reduction unit providing a 6:1 gear ratio for applications requiring low power take-off speeds. The K90R, rated at 3.6 HP, weighs only 52 lb. and includes such outstanding features as an oil bath air-cleaner, a fly-ball governor and a ball bearing mounted crankshaft.

### Material Spreader in Low Priced Field

A new material spreader introduced by Wausau Iron Works, Wausau, Wis., has no gears, motors, or complicated mechanical parts to cause repairs and loss of working time. It is designed for heavy duty, with rugged construction stated to assure long trouble-free service. The drive is by friction through an adjustable spring loaded spinner disc against a pneumatic driving wheel. Speed of rotation of the spinner disc at any given speed — controlling width of spread — is accomplished by adjustment of the position of the wheel on the axle. The quantity of material reaching the spinner is controlled by an adjustable cone.

### Two New Front End Loaders

Two new heavy duty loaders, the "Loadmaster" for larger tractors and the "Special" for smaller tractors are now in production by Shawnee Manufacturing Co., Inc., 1947 N. Topeka Blvd., Topeka, Kans. The basic design for the Loadmaster has been made on the Fordson major diesel tractor, whereas the basic design on the Special has been completed for all of the Ford and Ferguson model tractors.

For more ideas on Equipment and Materials . . . see page 107

# ROADS AND STREETS



## Cover Story

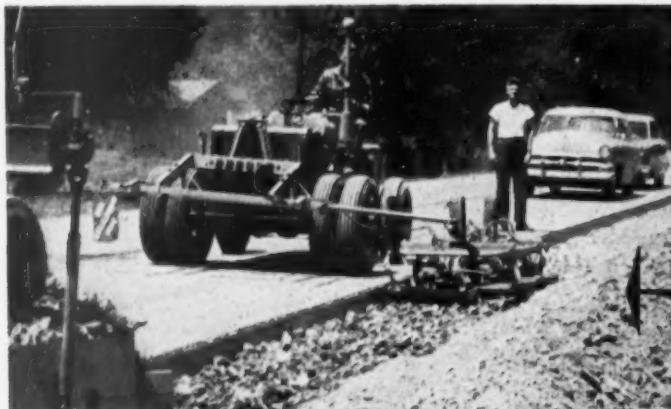
Compacting loose stone with a double-surface multiple compactor on a recently completed section of the New Jersey Garden State Parkway.

Published by the  
22 Major Associations of Engineers

Wire Reinforced Overlay on Turnpike Job  
Comments on Martin's "Here Is a Hot Mix" Article  
Latest Developments in Equipment and Materials

OCTOBER 1954

**Best way to achieve SPECIFIED DENSITY  
in ROCK, SLAG, SOIL-BOUND MACADAM, GRAVEL  
and  
SAND BASE COURSES..**



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## JACKSON VIBRATORY COMPACTORS!

On jobs such as this, soil-bound macadam — 5 inches thick, the JACKSON MULTIPLE COMPACTOR, now more powerful than ever, achieves specified density in JUST ONE PASS. It is equally efficient on rock, or slag base and all other granular soils.

Quickly adaptable to widening, the JACKSON MULTIPLE COMPACTOR is shown here consolidating slag macadam base course 36 inches wide and 9 inches thick. Using three of the machine's powerful compactor units in tandem, it readily obtains specified density in ONE PASS.

Twin hook-up of manually guided JACKSON COMPACTORS consolidating gravel base for a large pavement repair area. These machines, used singly or in tandem, or side-by-side twin hook-ups, are exceedingly efficient for all types of granular soil base and fill compaction; also for bituminous patching and driveway construction. Operated from a trailer-mounted JACKSON POWER PLANT which may also be used for other power tools and lights.

*See*

your Jackson Distributor or write to us for complete information on these machines.

**JACKSON VIBRATORS, INC. LUDINGTON, MICHIGAN**



Here's the answer to  
**your road building** problems!

- Add advantages of asphalt road construction or resurfacing . . . quick laying, easy upkeep, long service, low cost . . . to the availability of Standard Oil asphalt. That's the answer to your road building problems.

With five asphalt-producing refineries located throughout the Midwest, Standard offers you savings in shipping time and costs. Call your local Standard Oil office.

**STANDARD OIL COMPANY**



*(Indiana)*

# BITUMULS® saves you money on maintenance



## Performance is the Reason

**BITUMULS IS ASPHALTIC BINDER IN EMULSION FORM.** Applied cold, it bonds well with every type of clean surface; it thoroughly coats all types of aggregates, wet or dry. It can be used in damp weather and even at relatively low temperatures. For the deep penetration required on trench repair (above), Bitumuls has no equal.

These features add up to real savings on any maintenance program: you save the time and expense of heating; you eliminate the need of a special prime or tack coat; you work with local aggregate of all kinds, lowering the expense of importing material; you save time lost due to showers; and you can start work-season earlier, keep going later in the year.

Bitumuls is available in grades for all types of maintenance work. Fast Setting for Sealing, Surface Treatment and for Penetration work; Mixing Grades for fast, uniform coating of a wide range of aggregates, from sand to clay-gravel.

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R. B. Best, President of Southwest Paving Company, Sun Valley, California, which is recognized as the largest producer of bituminous mix materials in the country... has purchased 10 MADSEN Asphalt Paving Plants during the past 33 years! This successful contractor knows what it takes in an asphalt plant to make money on job after job. Here's what he says about his MADSEN Plants:

**Our MADSEN Asphalt Plants have always produced top tonnage and our maintenance costs have been extremely low. The service which MADSEN has given us in parts replacement has been outstanding, and all through the years we know of no service delays which have been incurred upon us due to MADSEN not having adequate stock of parts to fill our needs.**



Throughout the years MADSEN's superior engineering has added many "firsts" in the asphalt paving industry. For example: one-man control of mixing operations, which increases production and reduces labor costs...unit-type plant and the jack-erection system which makes MADSEN plants easier to move and erect...and the MADSEN Asphalt Pressure Injection System (Patent No. 1987243) which assures a more uniform mix and reduces batch mixing time.

Keep this combination of MADSEN advantages in mind when you buy an asphalt plant. They have helped to make MADSEN buyers—repeat buyers...to make MADSEN the West's greatest name in asphalt plants!

**►This 4000-lb. batch capacity asphalt plant complete with MADSEN Aggregate Dryer and MADSEN Dust Collector is the 10th MADSEN Plant purchased by Southwest Paving Company.**



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## BATCH CAPACITY ASPHALT PLANTS

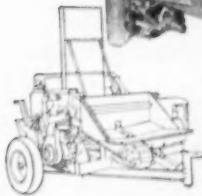
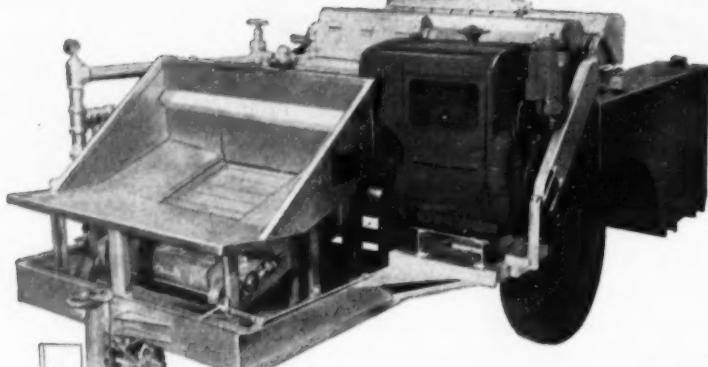


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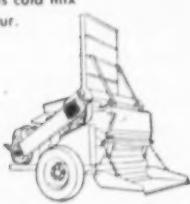
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HTD-JR ASPHALT MIXER

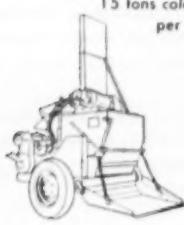
NEW!



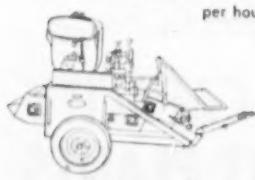
HTD-LP . . . up to 10 tons hot mix,  
30 tons cold mix  
per hour.



HTD-500 . . . up to 7 tons hot mix,  
15 tons cold mix  
per hour



HTD-B . . . up to 5 tons hot mix,  
10 tons cold mix  
per hour



JR . . . up to 60 tons cold mix  
per hour.



**UP TO 60 TONS COLD MIX  
or 20 TONS HOT MIX PER HOUR  
for resurfacing and patching**

Especially recommended for continuous operation in the production of cold bituminous mixtures, the new *McConnaughay* HTD-JR will handle up to 60 tons per hour on location . . . assuring exceptionally fast, low-cost resurfacing.

With a 24-inch metal conveyor for proportioning the aggregate and a 55-gallon-per-minute positive displacement pump for proportioning the bituminous material, this *McConnaughay* HTD-JR can produce one ton per minute on the job! Thanks to a trailer-type hitch with a lever-operated mechanical jack leveling device, the unit may be coupled to aggregate trucks for mixing and depositing on the move.

In addition, the new *McConnaughay* HTD-JR is designed and equipped to produce up to 20 tons of hot mix per hour for pavement resurfacing and patching. The value of such versatility is evident; your assurance of fast, economical asphalt mixtures for practically any job, on any location, at any time of the year. Write, wire or phone for details and specifications today.

**K. E. MC CONNAUGHAY**  
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## Placing Wire

THE resurfacing of 22 miles of the Pennsylvania Turnpike with asphaltic concrete reinforced with steel welded wire fabric has been in progress during the past (1954) summer. The topping project, largest single resurfacing job ever let by the Turnpike Commission, and the largest use yet for the increasingly employed fabric-in-asphalt process, is being done by the Latrobe Construction Company of Latrobe, Pa.

The 22-mile stretch of the pioneer super highway between Laurel Hill Tunnel on the west and Allegheny Tunnel on the east centers on Somerset, Pa., is probably the single heaviest travelled sector of the pike. Part of the original pike built in 1940 without a prepared sub-grade, foundation, or today's improved draining methods, the reinforced portland cement concrete pavement has held up exceedingly well despite exceptionally heavy traffic, plus the unanticipated overloading of the war years.\*

Although not built with air-entrained concrete, only recently has the surface shown signs of wear, making resurfacing advisable. All slabs are structurally sound.

Original thought of the Turnpike Commissioners in specifying welded wire fabric was to use the steel mesh only over the joints and cracks and utilize its ability to prevent formation of reflection cracks in the new surfacing.

Other applications in past years had indicated the effectiveness of fabric in minimizing or preventing such cracking, the bugaboo of many asphalt jobs.

It was decided, however on part of the work, to employ welded wire fabric continuously, rather than just at transverse joints. This continuous use of fabric, in addition to controlling cracking of the asphaltic surface, helps to prevent "rippling" and "shoving" of the asphalt.

### Four Job Steps

The resurfacing has been done by the Latrobe Construction Company, in four principal steps. First, pavement slabs of the original turnpike were cleaned and joint-sealing cut

\*See "How Grandaddy Turnpike Pavement is kept in Good Repair," ROADS AND STREETS, November, 1953.

# Reinforced Overlay on Penn Turnpike Section

back to level. Second, workers laid the sheets of welded wire fabric, 11½ ft. paver, and lapped and fastened them. Hog rings were used for fastening and were slipped over the longitudinal wires of the fabric, thus allowing the sheets to move as the hot mix causes expansion.

Third, two Barber-Greene pavers operating in tandem, equipped with "hold-down" devices to prevent the fabric from entangling in the spreader, laid a 2-in. compacted course of binder material across the entire 24 ft. lane width, over the welded wire fabric. A three-wheel, 10-ton Galion "Chief" roller performed the initial compaction, followed by two Buffalo-Springfield tandem rollers for diagonal and cross rolling.

A day or two later, a 1-in. deep wearing course was placed and compacted by a two-wheel Galion, a three-wheel Galion, and a three-wheel Buffalo - Springfield tandem. The placing of the wearing course was sublet by Latrobe to the Allegheny Asphalt and Paving Company of Pittsburgh.

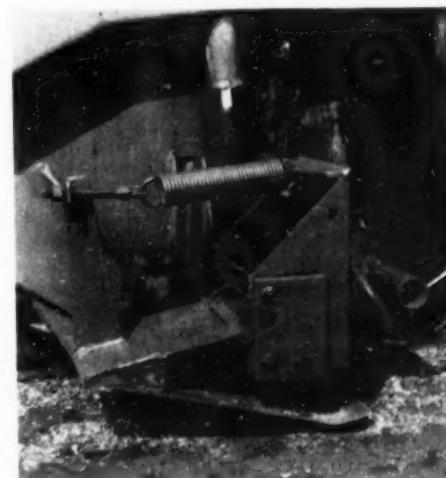
Hot mix for the binder course was hauled in 16 to 18 ton loads from two Latrobe batch plants in Latrobe, Pa.,

40 miles from the end of the job. Wearing course material was hauled from a plant set up by Allegheny outside of Sommerset, center point of the job. Unusual feature of the wearing course was the use of slag sand and slag coarse aggregate, specified by the Turnpike Commission.

The binder course, which conforms to Pennsylvania state highway department specifications, known as Bituminous Surface course ID-2, comprises larger than normal stone aggregate, up to 1½ in. with a maximum bitumen content of approximately 4.6 percent. (A mix of this type is usually used to reduce bleeding in warm weather, under heavy traffic conditions.)

The laying of asphaltic concrete got off to a slow start, a sudden wet spell plagued the contractor and stopped work four out of ten working days. Admittedly a new technique for the contractor and his operators, the use of fabric-in-asphalt required, as always, reasonable precautions in laying and fastening steel sheets and paving over them. But after the pavers were equipped with "hold-down" devices for preventing the fabric from entangling in the spreader, little trouble in laying the steel reinforced base course was encountered. On the seventh day the contractor laid more than a mile of binder course over the fabric.

After this seventh day of work,



● (Left): "Hold-down" shoe for paving machine, to expedite laying fabric-reinforced mix. Lower leg of shoe presses downward as tension spring tends to cause V-shaped plate to turn clockwise about pin-and-hinge at right end of upper leg. Turnbuckle on bracket allows tension of spring to be changed. Shoe on each side plus trailing railroad rails between crawlers keep fabric flat ahead of mix placement.

● (Right): Worker fastens hog ring around intersection of longitudinal and transverse wire of top (near) sheet of welded wire fabric, but around only the longitudinal wire of lower (far) sheet. This allows fabric to adjust and move longitudinally as heat of mix causes expansion. Transverse wires are faced down so that paver, in effect, slides along the longitudinal wires. Second transverse wire from end of each sheet has been omitted in sheet manufacture to reduce amount of metal at overlap.

● Pavers operated in tandem resurfacing Pennsylvania Turnpike. Scattering of aggregate ahead of pavers and trucks helps crawlers get traction up grade.

## More Comment on Martin's

# "Hero in a Hot Mix Plant"

## And Reply by the Author

**By S. B. Hudson**

Project Engineer, Miller-Warden  
Associates, Consultants, Swarthmore, Pa.

To the Editor:

I read Mr. Martin's article in the May issue of *ROADS AND STREETS* with great interest.\*

I heartily agree with Mr. Martin's sentiments with respect to obtaining representative samples of aggregates and his recommended method of sampling stock piles should give satisfactory results under conditions where it is applicable. However, his remarks about mix design might be misunderstood at the plant inspector level.

This matter of wet vs. dry analysis is an old controversy, but I do not consider that Mr. Martin's statement that a mix design predicated on the wet analysis is "erroneous," or the general implication that it is better to disregard standard methods, is entirely justified. The basic reason for determining gradations seems to have been overlooked.

In this method of plant control by gradation tests alone it is particularly important that significant variations in the gradation be recognized and controlled. Because of the great influence of the minus 200 fraction on the voidage and stability of the mix it is essential that the effective quantity of this material in the mix, and the F/B ratio, be closely controlled. It may be controversial as to whether the

effective quantity is indicated by the wet analysis in all cases, but it can be demonstrated that there is little correlation between the quantity of minus 200 material in unwashed aggregates as indicated by a dry analysis, and the physical test properties of the mix. Consequently I do not consider it safe to control plant production by dry gradations alone except in the case of completely clean aggregates.

### "Dry" Test Example

A recent incident at one of the plants on the Garden State Parkway paving, in producing a single aggregate mix used as base, illustrates this point. The minus 10 portion of the bank run aggregate used in this mix showed a small and fairly constant minus 200 fraction on a dry shake. On wet analysis the minus 200 is normally about 5 to 7 percent. A drop in the minus 200 to below 3 percent, as shown by washed analysis, was accompanied by a drop in stability to a dangerously low level. The deficiency was immediately remedied by blending, but the point is that an unsatisfactory pavement would have probably resulted if control had been by dry analysis alone.

### Making Washed Analysis

In a situation such as described by Mr. Martin I would recommend that a washed analysis be made on the fine fraction of the hot bin material as well as the raw aggregate. Although we were reluctant to make this recommendation in connection with GSP work because of the addi-

\*Pitfalls and Pointers in Asphaltic Concrete Production (or — How to be a Hero in a Hot Mix Plant) by J. Rogers Martin, Engineer-Manager, Hot Mix Asphaltic Concrete Association of Oklahoma, Inc., Oklahoma City.

(Continued from previous page)  
however, with 4½ miles of the binder course completed, the Turnpike engineers directed that henceforth the welded wire fabric be placed only over the transverse joints and random cracks as originally planned. Apparently the delays caused by inclement weather, coupled with difficulty in getting delivery of hot mix to the job, occasioned concern that the entire project might run past the October 15 target date, and the amount of

fabric was reduced in an effort to save time.

To complete the resurfacing project, Turnpike maintenance forces followed the pavers and added a compacted dirt and gravel mixture to the shoulders and medial strip to match the level of the new pavement surface. With the intermittent center stripe painted and dried, the resurfaced portions of the Turnpike were re-opened to traffic in a matter of days after the start of construction.

tional expenditure for man-hours and equipment required, initial experience proved the necessity and we are now routinely making washed analysis of the hot bin material in the field labs at both the single aggregate and high type mix plants. To be completely consistent the extracted aggregate gradation should be determined by washing in a solvent. This has some impractical and undesirable aspects and I am at present experimenting with various detergents.

### Impractical Methods

Although the means described by Mr. Martin for obtaining a sample of the completed mix is probably superior to most of the methods in actual use, it might be somewhat impractical under certain conditions. I am presently experimenting with a special tool which can be inserted into the stream of material falling from the pug mill. In this way increments can be obtained from different portions of several batches to make a composite sample. The tendency to lose particles of coarse aggregate must be guarded against in any sampling procedure and I think that this precludes the use of flat surfaces, such as trowels and flat shovels, for sampling purposes.

I have had some difficulties with warped extractor bowls and have found that the use of double rather than single filter disks is helpful. I do not consider that it is safe to assume that ash corrections need be run only occasionally, particularly if the ash correction is large. We are routinely running ash determinations on each extraction and have now under way a series of tests on pavement samples which we believe will establish the necessity for this procedure. The use of a 1500-gram sample is not desirable in my opinion. I think that the sample should be quartered down to somewhat less than 1000 grams when a rotary extractor is used. With a large aggregate type of mix such as Mr. Martin describes it would probably be preferable to use a larger sample in a Maryland type extractor.

### Questions Field Adjustment

Although I fully recognize the necessity of adjusting job mix formulas after plant production is initiated I do not think these adjustments should be made in the field unless testing equipment is at hand with which the effect of these changes on the physical test properties of the mix can be determined.

I was very much interested in the method proposed by Mr. Martin for correcting gradations of extracted ag-

gregate. We have worked out a parallel correction for asphalt content, based on surface area, but have not fully tested its reliability.

As you can see from the above I found the article stimulating and thought provoking. I, of course, would like to see many of the same type. The current trend appears to be towards closer plant control and I would think that contractors and plant operators would be interested in the purpose of the stricter requirements.

•

### Author's Comments

To the Editor:

In all sincerity, I wish to express my admiration for Mr. Harry M. Rex (\*) and for Mr. S. B. Hudson (see foregoing) for wading through an article as long and as technical as the "Pitfalls and Pointers" analysis. The compliment they have thus paid the writer largely offsets the injury to his ego, brought about by the fact that they did not agree with certain views expressed in the article.

Both of these gentlemen very definitely took issue over my statements concerning the wet analysis of aggregates. I took the stand that a mix designed predicated on the wet screen analysis would constitute a "booby-trap." Perhaps I should hasten to explain why the phrases "booby-trap" and "wet screen analysis" became associated in my mind.

For many years, most of the rebellious southwestern states have employed the dry screen analysis in testing aggregates recovered from solvent extraction. Texas, for instance, has built a fine system of hot mix pavements, all controlled by the dry screen analysis at the hot mix plant. To even suggest that they abandon the dry screen analysis and use a wet method would be dangerous. They have threatened to secede from the Union for less. This practice is equally well established in Oklahoma.

Some time ago I was associated with a major paving job, with a large portion of the responsibility for bringing the plant into production. The design called for 6% minus 200 mesh material with a lower limit of .4%. The first trial mix yielded 2%. After two days of juggling stock piles, varying the cold-feed proportions and otherwise fretting and sweating to no avail, we gave up and started out in search of a fine sand — which is rare in those parts.

This occurred on Sunday, on which

(\*Comment by Mr. Rex appears in ROADS AND STREETS, August, 1954, page 108.)

day I habitually loll in an easy chair. Now, when I have to roam around the countryside with a sharpshooter and sample sacks on my day of relaxation, I consider myself caught in a

(1) — — — — trap.

It was on this fateful Sunday when I discovered that the mix design had been predicated on the wet analysis, pure and simple. Had I investigated and found out about this in the beginning, we could have gone on our search for fine sand on Friday instead of Sunday. I came to the conclusion that I had played the part of a

(2) — — — — booby.

Combining (1) and (2) and transposing we have the phrase

(3) — — — — Booby-Trap

Regardless of the relative merits of the wet and dry analysis, it must be remembered that an essential function of the mix design is to assure the engineer and contractor that a mix can be produced from the materials at hand which will be within job specifications. In order to do this, the same method for determining the minus 200 material should be used in formulating the design and in controlling the mix. If the design is predicated on a wet screen analysis, using water, then the control test should be run in the same manner.

What will this lead to?

(1) It lengthens the time of making an analysis with the result that a mix which is borderline, or out of specifications would continue to be produced and placed, long after it should have been corrected.

### Gives Misleading Results

(2) It gives misleading results. Water breaks down agglomerate lumps which actually exist in the mix in their original unbroken form. For support of this statement take almost any hunk of finished hot mix pavement, break it up, immerse it in water, shake it thoroughly, and allow it to soak 24 hours. Dispersed in the soak-water, one will find fine sand, silt and possibly clay. These particles are uncoated, because they were originally inside of a lump which was encased in an asphalt membrane. Soaking and agitation causes the protective membrane to become ruptured at some point and the swelling action of the water does the rest. Such lumps can sometimes be spotted by usual examination on the face of a sawed paving specimen which is known to be of very good quality. Thus, an appreciable amount of the minus 200 material, as shown by the wet analysis, may actually remain immobilized in the form of lumps in the finished mix.

(3) It introduces an additional

source of error in an analysis which, in its simplest form, requires a high degree of skill to obtain good results.

I think this whole controversy can be pinpointed by the question "Where should aggregate-quality evaluation stop, and functional control begin?" The principle virtue of a wet wash analysis is that it will show up clay and undesirable aggregate coatings. This is because a large divergence between the wet and dry analysis is a general indication of excess clay in the aggregates, which is certainly not desirable. For this reason it is a good practice to run the wet wash analysis in conjunction with the dry wash *when the mix is designed*. A better method is to determine plasticity index on the aggregate, or better still, evaluate the minus 200 material by means of F. N. Hveem's "Sand Equivalent Test."

### Belong in Lab

All of these are aggregate evaluation tests, which safeguard against harmful clay. The time and place for them is in the designing lab and not in a field lab. When the aggregates are stockpiled and the plant is ready to start, the quality of the aggregates should have been fully evaluated. If this is done, additional quality tests on each extraction are comparable to throwing a ball into the air repeatedly to see if it will come down again. Once the plant is started, functional control becomes paramount. This means that the quickest, most dependable means possible be used to make periodic checks on the accuracy with which the mix is being proportioned. Under these circumstances, I cannot see the justification for lengthening and complicating the test procedure by making a wet wash analysis.

I am glad that Mr. Rex and Mr. Hudson took issue of this matter. The determination of dust in aggregate mixes has been carelessly and thoughtlessly handled in many instances in the past. I frankly don't know who will prove to have the right answer. I do know that more consistent practice is sorely needed, and hope that it will come about in the near future.

In the true spirit of gentlemen, Mr. Rex and Mr. Hudson also made some favorable remarks about the article. For this I am truly grateful. They also made some very constructive suggestions. I am very interested in Mr. Hudson's hot mix sampler and also in his method for correcting the asphalt content to compensate for a sample with non-representative grading.

— J. Rogers Martin

## VIEWS AND COMMENTS

### How Can We Make the Most of an Enlarged Road Program?

WE BELIEVE the recent speech by President Eisenhower proposing a greatly augmented road program, essentially self-liquidating in nature, offers great possibility to all concerned with the future of highways. The immediate aspects of his comments and proposals have received much attention. We are more concerned, however, with the long range possibilities inherent in the point of view he implied. We believe they will be in the end much more important if properly pursued.

The first fundamental is the President's recognition of the basic importance of our highway system in the American economy. For a number of years our economists have pointed out that there is a limit to the benefits possible from mass production. They, and the business executives concerned, have emphasized that our distribution costs are becoming too large a factor in the price required for our products. Transportation is of course an important item in these costs; anything aiding it will be reflected in them.

#### Consumer Prices Affected

However, the raw materials involve similar costs previous to manufacture. So that the price which should result under our free enterprise system for any product placed in the hands of the consumer will be greatly affected by transportation costs. Inevitably these involve the expense of highway movement.

The second fundamental is the matter of investment self-liquidation. His remarks concerned early pay-back from revenues generated by the increased use of the facilities. If, however, we view our national economy as a whole, another item in the pay-back may loom even larger in the calculations. This is the decreased cost of transportation after the above revenues have been paid. When a dirt or gravel road is given a suitable

light type pavement, or when a direct and fast route for arterial traffic is created, the nation is still saving after the higher tax revenue from the additional traffic has been received; these savings are in the form of decreased operating expenses on the equipment and decreased labor charges.

For our country as a whole such savings can result in very rapid pay-backs on these additional expenditures for highways. Were similar savings open to a business organization through private investment no company would dare fail to somehow find the money and make the investment immediately. If the administration puts over its road proposal and real values are produced from the funds, these principles will be firmly established and highway financing will never again be as difficult as in the past.

#### Getting Money's Worth

These two points, which involve essentially a better understanding of just what good roads mean to us as a business proposition, lead to two other aspects of this situation which we believe important. They are basic requirements if the responsibility implied by the increase program is to be properly met. Our highway administrators and engineers will be on the spot to show that they can spend large sums wisely, and that they can properly utilize this extra money to serve the most people in the best possible fashion.

We think it critical that those responsible make sure the greatest possible results are obtained from the expenditures. Ample money, like haste, makes for waste. This is a natural human tendency — it might be included in what could be described as the laws of human behavior — to spend with less care when there are ample funds available, even though there are likewise ample needs for all these funds and perhaps more.

By H. G. Nevitt

The rich man's son with a generous allowance does not choose between his desires with the same care as does the poor child with limited pocket money.

With some outstanding exceptions our states in highly populated and wealthy areas are not getting anything like the return per dollar expended, even on the same type of highway, as do the highway departments in the agriculture and predominantly low budget regions.

We recognize the greater cost of right of way and certain intangible factors which run up the cost in some areas or in certain types of construction in these states with large highway funds. However, the comparison in areas showing almost identical conditions is definitely in favor of the low income states, where they have learned to scrutinize every expenditure and make certain that the most in results is obtained from it.

#### Wartime Lesson

If there is any question as to the merit of our position we merely refer to war expenditures to convince anybody that, no matter how great the need, large funds are rarely spent wisely unless scrupulous care is taken to make sure that waste does not occur. We want to emphasize that this waste is only occasionally in improper expenditures from the standpoint of ethics. It rather comes from a lesser urge to adopt the most economical design, to take advantage of the latest information, to exert the efforts required to utilize local materials — in brief, from all the things which may be summed up as taking the easy way.

We continually stress the fact that economy in highway construction requires the best possible engineering. Such will be needed more than ever. Large expenditures make possible better laboratories, better organization, and all the other things that should lead to lower unit costs for both design and control. But to take advantage of these potentialities we need better engineering. The same situation exists on the actual construction. By proper planning the great benefits inherent in mass production can be obtained. We again comment that the best highway engineering is demonstrated by the cheapest structures rather than the most elaborate, the most miles for the money rather

than monuments to the builders.

#### Ample Budgets Beget Waste?

We also wish to stress another point, that the waste noted where ample funds are available in the end benefits no one. The public certainly loses if fewer miles of high type but unnecessarily expensive roads are built instead of the greater mileage possible from utilizing the most economical materials and putting the money where it will do the most good. A total budget of these high priced roads rarely means as many ultimate dollars in contractor profits as more miles of standardized construction whether or not local materials and other economies are present in the design. The fancy jobs too often involve operations on which there is little profit.

Mass production in highways means money to the manufacturer — in this case the contractor — the same as it does in industry. In the same way, the equipment makers or suppliers have little to gain from these high priced jobs. They sell more, as well as more profitable, equipment for the mass production operations. Even the engineers and politicians concerned in the end will find that more miles of roads which really serve the purpose, gain appreciation and support to a far greater extent than elaborate and expensive structures which may attract temporary attention but do not too much benefit the daily lives of the voters or aid their pocketbooks.

Along with determination and care to do the better jobs for the money that these larger funds will make possible there should be a program which allocates expenditures on a truly fair basis from the standpoint of needs, benefits and economics. The present stress is on national highways, relief of congestion on arterial routes through cities, and similar. These are wants most glaringly obvious, and

## LUCAS ASPHALT COMPACTOR



#### Eliminates Hand Tamping

This portable, precision-built compactor is used for tamping and rolling asphalt close to walls, light poles, traffic signals and in all inaccessible places . . . and for use on all types of asphalt patching and repairing jobs.

#### WE WANT DEALERS

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2209 E. Market St.  
Stockton, Calif.

The **BEST**  
for more than  
one reason . . .

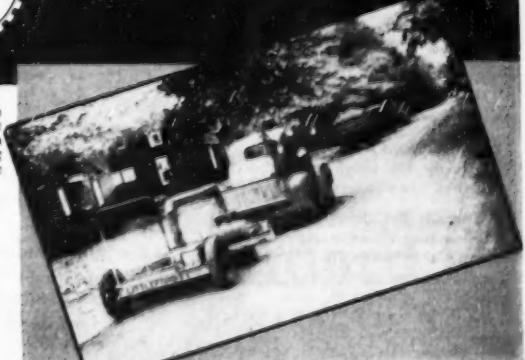
- Patented Hydraulic Brush Raising and Lowering System

- Mono-Frame Construction for light weight easier handling.

- Sweeps right, left or dead center change over requires 30 seconds.

- Adjustable Brush Tension on Road saves brush wear.

## LITTLEFORD ROAD BROOMS



Littleford Road Brooms are designed to make highway sweeping a low cost job. Both the Motor Driven and Traction Driven Brooms are engineered to operate with the least amount of effort but with 100% efficiency. Hydraulic brush raising and lowering system saves wear on the brush as the right tension can be adjusted for each particular sweeping job. The whole weight of the brush does not necessarily have to rest on the road surface when sweeping. This saves Brush wear — saves money. Write for Bulletin 19.



**LITTLEFORD**  
LITTLEFORD BROS., INC.  
454 E. PEARL ST., CINCINNATI 2, OHIO

therefore assured of the best possible recognition from the public. As a large city dweller and primary user of such arterial roads the writer can personally vouch for their need. They will save transit time, and otherwise show tangible economic benefits which, incidentally, are probably more important than the saving of time to the average citizen in these days of short working hours.

#### Better Local Roads

However, we also need more and better local roads. The benefits from a farm-to-market road system have been thoroughly discussed. But there are also direct gains from converting

a larger proportion of such systems (either those now existent or to be built) from dirt or gravel to a light type paving. The reduction in operating costs per vehicle mile resulting from such a step is sufficient to pay back on a tremendously greater mileage of low type paving if the funds can be found.

Our mountain states have shown what can be done to develop a region by the suitable paving of extremely low traffic count roads; the direct increase in revenues has alone verified the wisdom of such expenditures. If, however, the over-all saving to the public, and the increased value of the property served, are likewise brought

into the picture, the minimum traffic count for which a really well selected light type pavement can be justified drops to a remarkably low figure.

We need a proper balance between an improved arterial system and the greater development of low traffic secondary roads, with the decision properly based on fundamental economics rather than on the less informed public demand for each. Fortunately, the amount of money under discussion should permit doing enough in each field to satisfy all but the most carpings of critics.

We believe that the above discussion can be summed up by two statements.

The first is that the enlarged program we hope will materialize from this new point of view and interest in roads, offers a great opportunity as well as a large responsibility to those charged with highway expenditures.

The second is that the increased funds demand more care, better engineering, and the soundest possible economics to insure these opportunities and live up to the responsibilities.

We believe that wise handling of these sums will give us Big Transportation along with Big Government and Big Business. If the converse is true, if the money is not well spent, we doubt if there will be continued interest in providing large sums for highways building, regardless of the benefits which intelligent analysis shows should result. The public will simply refuse to approve big funds regardless of the apparent need, as is being encountered in other avenues of public expenditures.

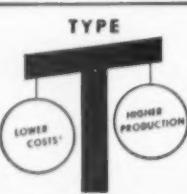
We continually stress that economy in highway construction requires the best possible engineering. It would appear that maximum returns from large expenditures make similar demands for technical competency along with the best judgment and planning available — in brief, the things which the engineer is supposed to supply.

#### Close 128 crossovers on Worcester-Boston arterial

An example of "interim" action pending a start of toll turnpike construction in Massachusetts, is the decision to add safety features to the existing multi-lane Worcester Turnpike. This highway which was a pioneer divided highway but which lacks modern access control has had a high accident rate. The Massachusetts department of public work has announced a \$600,000 program to close off 128 road crossovers at grade.



## Increased Production—Lower Maintenance Costs



\*Both original and maintenance

**New Structural Design**—All-welded bent plate construction.

**Flat Screen**—Adequate screening area on all sizes.

**Self-Contained Dust Bin**—Empties directly into weigh box, eliminating screw conveyor.

**Trunnion Roll Drive**—on dryer, eliminating vibration and reducing maintenance costs.

The new H & B Type "T" incorporates, in the basic plant, all of the major improvements of the past 20 years. New structural design and many exclusive features combine to make a plant that has already established outstanding records in both production and maintenance.

In addition to the features listed at the left, air controls and self-contained overflows are standard equipment on all Type "T" plants. No loose pieces to move or erect. 4 sizes—from 25 tons to 160 tons per hour—to meet your requirements. Available with electric, Diesel electric, Diesel or gasoline power. Factory wired plants available when electric power is used.

For specifications and complete information, write for Bulletin T-54.

**HETHERINGTON & BERNER INC.**

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## What's New in Equipment and Materials

(Continuing from pages 83-94)

### Soil Testing Device



Washington Densometer

In field testing of soils, an entirely new principle has been applied in the Washington Densometer, according to announcement by Charles R. Watts & Company. This development is the result of two years research and experimentation by State of Washington Department of Highways. This device is stated to offer outstanding advantages to earthwork engineers and contractors in accurate testing of a wide range of soils, fine or coarse, and in hole sizes of from 0.000 to 0.500 cu. ft. This testing apparatus is light in weight, compact, very portable — is simple to operate and maintain. Readings can be taken in about 3 minutes after hole is dug and successive determinations on any number of thin layers can be made in the same hole up to 22 in. deep, singly or in successive lifts. Detailed information is available from Charles R. Watts & Co., 4121 Sixth Ave. N. W., Seattle 7, Wash., exclusive sales agents.

### Interlocking Steel Paneled Building

A new Model Steelex (interlocking steel paneled) building has been announced by Armclo Drainage & Metal Products, Inc., Middletown, O. The 40 ft. buildings are now available in heights up to 20 ft. The units can be placed side by side, making the total floor area to be enclosed virtually unlimited both as to width or length. Columns are placed every 40 ft. in one direction and every 20 ft., or 32 ft., as required, in the other direction. Additional features of the new Steelex structures are lean-tos and open sidewalls. A combination of these and the multiple widths enable builders to better adapt the units and to meet a much wider range of conditions.

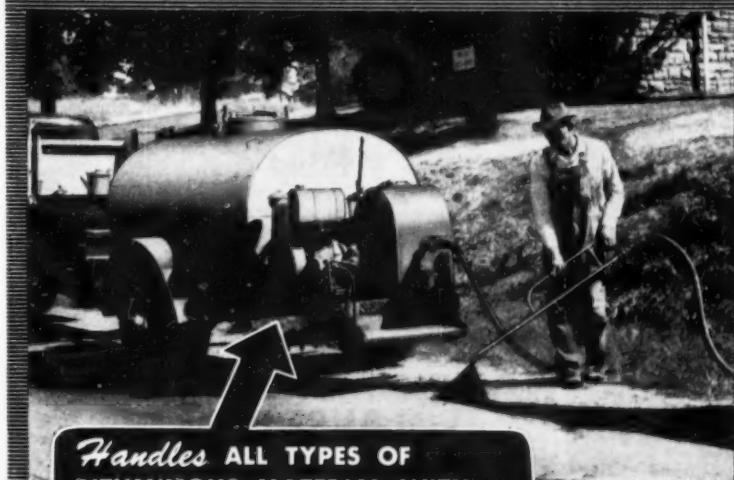
### 8-Ft. Tires Now in Production

United States Rubber Co., Rockefeller Center, New York 20, N. Y., is now making in its Detroit plant the largest tires in its history — tires that weigh 2600 lb. and stand 8 ft. tall — for use on earth-moving and strip mining equipment, bottom dump trucks and self-loading scrapers. These nylon tires are 30.00-33 in size and have a 40-ply rating. They far exceed in size the 24.00-32 tires that had previously been the largest ones made by the company. The new tires are called U. S. Royal Con-Trak-Tors, and have a full lug tread design that insures excellent traction.



U. S. Royal Con-Trak-Tors Tire

## MILES OF SHOULDER Easy and Fast with Standard Steel "S-J"



Handles ALL TYPES OF  
BITUMINOUS MATERIAL WITH  
EFFICIENCY — ROLLS WITH SPEED  
FROM JOB TO JOB — MORE MILES  
OF WORK PER DAY

Raveling shoulders, chuck holes, surface cracks and all other road breaks quickly run into heavier and more costly damage under heavy day after day traffic. The Standard Steel "S-J" can be used with equal success on emergency spot jobs as on "miles of shoulder" or laying driveways, school grounds or any other secondary construction. A thoroughly dependable "S-J" will save money and do a top grade job in fast time on many jobs that are in the "big equipment class". Get the facts on "S-J" before you consider any other type of similar equipment.

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### OTHER PRODUCTS

Asphalt Pressure Distributors,  
Tar Kettles, Patch Rollers, Supply  
Tanks, Tool Heaters, Asphalt  
Tools, Street Flushers, Construc-  
tion Brooms.

Built to the Highest  
**Standard**

Standard Steel Works NORTH KANSAS CITY, MO.

## Low Bed Trailer for Small Equipment

An all-new line of low bed tilting platform trailers for hauling rollers, tractors, bulldozers and other small equipment has been announced by Mastercraft Trailers, Inc., 300 Middlefield St., Middletown, Conn. The new line includes five models for transporting equipment from  $\frac{1}{2}$  to 5 tons and was designed to provide reliable transportation for small construction equipment at low cost.



Low Bed Trailer for Small Construction Equipment

## Ditching Machine to Dig 15 ft. by 30 ft. Trench

A ditching machine, capable of digging a ditch 15 ft. wide and 30 ft. deep, is now being designed by Gar Wood Industries, Wayne, Mich. The new ditcher, Gar Wood Buckeye Model 435, will be used to excavate intercepting and outfall sewer trenches, water diversion aqueducts and other large ditches. It will sell for about \$100,000. Overall approxi-

mate dimensions of the new ditcher are: length, 81 ft.; height, 15 ft.; width, 12 ft., excluding the dirt discharge conveyor. Its estimated weight will be 65 tons. The ditcher will be built at Gar Wood's plant in Findlay, Ohio. The machine will be crawler mounted at the digging end and supported by rubber tired wheels in front. Two diesel engines with torque converters will supply power to the crawlers and the digging drive. Hydraulic power steering will be another feature.

## Improved Winch-Hoist

The Lug-All Co., 331 E. Lancaster Ave., Wynnewood, Pa., has announced that its Lug-All winch-hoist has now been equipped with a new and more rugged main frame that permits the advantageous use of this "featherweight" unit for many more applications than ever before. The ratchet teeth are now protected from rough surfaces by the new frame, which is a distinct advantage when working under certain conditions,



Lug-All Winch-Hoist

## Diesel Fuel System

A new and greatly simplified diesel fuel system, announced by Cummins Engine Co., Inc., Columbus, Ind., is claimed to make diesel fuel injection as simple, if not simpler than gasoline engine carburation and ignition systems. This new system, designated as the Cummins PT Fuel Injection System, completely eliminates fuel rack adjustments, high and low pressure check valves, spring loaded needle valves, helixes, distributor discs, metering pumps, high pressure fuel lines, and the necessity for timing the fuel pump to the engine. This new system is now standard equipment on all models of Cummins diesel engines and can be applied to all Cummins diesels built since 1932, thus permitting older engines to be completely modernized. The New PT Fuel System was designed by Cummins to eliminate the complication of the diesel fuel injection systems.

such as alongside steel wire or walls. The new Lug-All weighs only 9 lb., yet it can handle up to 1½ tons. It is equipped with a reversible safety handle that will bend when extreme overloads are applied. Loads can be backed off easily and safely due to an interlocking pawl arrangement. It has stainless steel springs, oiled-for-life bearings and a 133 strand flexible preformed aircraft cable, that winds on the drum and out of the operator's way.

## For Heating · Thawing · Melting · Drying

### HAUCK THAWING BURNERS



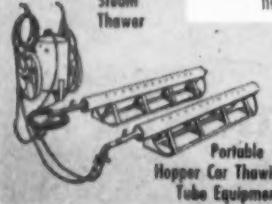
Torch Flame Thawing Outfit



Double Burner Thawing Outfit on Wheels



Superheated Steam Thawer



Portable Hopper Car Thawing Tube Equipment

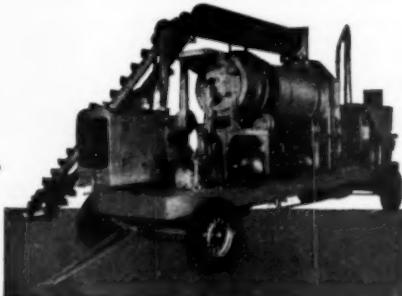


Powerful, Low Cost Flame-Gun

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When cold weather strikes, keep material, maintenance and production moving at very near normal. Provide immediate heat with speedy, efficient Hauck Thawing Torches and Heaters. Produce flame temperature 2000°F. and radiated heat. Burn kerosene. Easy to use. Need no air compressor.

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## Portable Asphalt Plants For City, State, Repairs and Small Contract Work

These 8-10 tons per hour Asphalt Plants economically repair almost any pavement. Asphalt, brick, concrete, macadam, can be resurfaced or patched. Alleys, driveways, sidewalks, industrial plants can be paved.

Produce for immediate hot laying, or for deferred cold patching. Match any bituminous surface.

Mixes at plant, including labor, fuel, and overhead, cost about \$4 per ton, with \$2 aggregate. Average 160 to 200 sq. yds. 1" thick per hour. A money-maker for small contract work.

Also larger plants, 15 and 30 tons per hour.

Write for catalog and name of nearest dealer

**Elkhart 20 White Mfg. Co., Indiana**

## Manufacturers' Literature

### Bituminous Distributors — 800 to 4,000 Gal.

A new 6-page bulletin, 54-3, on its line of bituminous distributors has been issued by Rosco Manufacturing Co., 3118 Snelling Ave., Minneapolis 6, Minn. The line includes both front and rear mounted models, in capacities from 800 to 4,000 gal. The equipment can be used for loading, transferring, spraying, circulating and provides application with pressure automatically maintained.

### Trencher for Pipe Lines and General Trench Work

The new Cleveland Model 240 trencher for pipelines and miscellaneous construction projects is described in a 4-page, 2-color bulletin (S119) published by The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, O. A full-crawler-mounted wheel-type trencher, the 240 digs up to 36 in. wide and down to 6 ft. 3 in. deep. Many new Cleveland design and construction features embodied in the 240 along with the job-proved features found in other Cleveland models are briefly described in the bulletin. Copy is keyed to a side-view photo of the 240 so as to clearly indicate the locations of the features described. Complete specifications of the Model 240 are given on the back cover, including a dimension drawing.

### Single Pass Portable Crushing Plant

A new 4-page bulletin describing the Cedarapids new single pass portable crushing plant has been issued by Iowa Manufacturing Co., Cedar Rapids, Iowa. Bulletin SPP-3 fully explains the principle of operation of the single pass plant and describes the features which make this one of the simplest and easiest crushing plants for producing aggregate for county and township road maintenance, city streets and alleys, small state contracts, jobs in out-of-the-way locations, base or blanket course jobs, and other work where portability and fast set-up are important. The hopper and feeder are mounted on the rear end of the plant, and the dolly on the front end, to permit easy backing up to the face of the gravel bank, without jockeying for position.

### Rock Anchor Bolts for Preventing Slides

In many locations the slight movement of a single layer of rock or of a group of boulders can cause hundreds of tons of overburden to slide or fall. However, if the geologic structure is such that stratified slabs of rock can be bolted together, or if individual boulders can be anchored to the bed rock, then it is likely that the slopes can be stabilized, and rock falls averted. To help reduce the danger from rock slides, Beth-

lehem has developed a rock anchor bolt. The bolt minimizes the danger of rock slides because it reinforces the rock formation, thus preventing layers of rock or individual boulders from sliding or falling. An 8-page booklet (No. 359) has been issued by Bethlehem Steel Co., Bethlehem, Pa., illustrating and describing these anchor bolts and telling how they can be installed.

### Pellet-Type Calcium Chloride

A 60-page manual which gives the first complete and authoritative report on the newly developed, high-test, pellet-type calcium chloride has been published by The Dow Chemical Co. The manual is entitled "Peladow." The publication explains why and how Peladow permits the transportation, storage and mechanical handling of calcium chloride in bulk and points out the significance of the bulk factor from the standpoints of lower costs and easier application for almost every use. Complete data on properties, specifications and applications are included. Separate sections are developed to Peladow's use in connection with highways, concrete, tire ballast, coal shipments, minerals, refrigeration, dehumidification, fire-fighting solutions and miscellaneous applications. The manual also explains the rapid and simple unloading methods that have been devised for the pellets. The Manual can be obtained free of charge by writing Inorganic Sales, Department 1, The Dow Chemical Co., Midland, Mich.

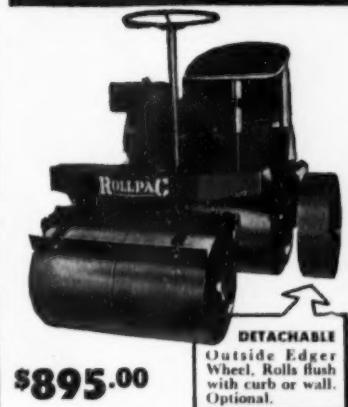
### Modern Equipment in Work Programs

The importance of modern equipment in work programs to develop and increase community services and conveniences, is graphically illustrated in the new 16-page booklet "Allis-Chalmers Offers New Economy For . . . Villages, Townships, Counties, Cities, States, Federal" now available from the Allis-Chalmers Manufacturing Co., Milwaukee 1, Wis. Action photographs take the reader to a wide range of community projects and illustrate the versatility and year-round use of tractors, motor graders, motor and pull-type scrapers, motor wagons, and power units, with their matched allied attachments. The multi-purpose uses of this equipment provides governmental bodies the means to employ new methods in old jobs that permit quicker completion of the projects and ultimate savings in costs of the work program.

### Calcium Chloride Stabilization of Bases and Wearing Courses

A new manual SMI, "Calcium Chloride For Stabilization of Bases and Wearing Courses," available from Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C., was written to assist highway engineers, contractors, and materials suppliers when they use calcium chloride in the construction of dense graded bases and wearing courses. The manual deals with the properties and design, types and methods of construction, and specifications. It is well illustrated, and information is presented as a guide for both design and construction engineers. The principles and recommendations presented are the result of many years of field application and laboratory research on the subject.

(Continued on page 122)

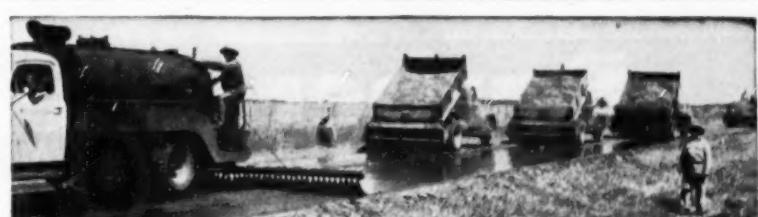


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The Barber-Greene is easily adjusted to increase or decrease its normal laying width of 10 feet. Dual controls. Heated screed. Large receiving hopper. Complete thickness control of over-all width, center, or either side.



**PAVE** profitably.

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Wiley 25 Ton, Steam, 85' Boom, Steel Barge, 100x40x6.  
Washington 45 Ton, Elec. 100' Boom, Steel Barge, 136x40x9'.

**Cranes — Draglines — Shovels**  
Koehring 304 — Crane-Dragline, S/N 7045; Lorain 50K Crane-Dragline-Shovel, S/N 21527; Lorain 50K Crane-Dragline, S/N 21939; Lima 802 Crane-Dragline, S/N 3669; Link Belt 75 Crane-Dragline-Shovel, S/N 1E937; Marion 93M Crane Dragline, S/N 8781, Unit 1520 on rubber, S/N 51088.

**Buckets — Dragline**  
**Clamshell — Concrete**  
5% to 1½ Cubic Yard Clamshell.  
½ to 4 Cubic Yard Dragline.  
½ to 2 Cubic Yard Concrete

**Compressors**  
160 — 250 — 315 — 500

**Finishing Machine — Asphalt**  
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**Tractors and Dozers**  
2—D7 Cats—7M & 3T.  
1—TD18—I.H.C.  
1—HG42—Oliver

**Mixers**  
2—28S Rex—16S Jaeger  
2—34E Single Drum Pavers

**Pump Crete**  
8" Rex—Double—Model 200A  
650 ft. Pipe—Excellent shape.

**Pile Hammers and Extractors**  
Vulcan OR—50C—400A  
McKiernan-Terry 10B3—9B3  
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**Hoists — Gas and Diesel**  
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Diaphragm  
1½" to 8" All Makes.

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Hoists, Jackhammers, Paving Breakers, Tampers, Clay Diggers, Wood Borers, Core Vibrators

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**Front End Loader**  
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12 Ton Plymouth Locomotive—Gas  
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Drop frame or flat frame  
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1½ yd. Manitowoc 3000A diesel cranes  
65' bm. Cat. D13000 engine.  
½ yd. Link Belt LS50 Backhoe-Crane  
30 ton Industrial Brownhoist Gas Locomotive Crane, 70' bm.  
44 ton GE Diesel-Elec. Loco. new 1951  
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30 yd. Western & Koppel Air Dump Cars  
25 tons Wiley Steel Stiffleg Derrick  
1200-CFM Ing. Rand XRE, 200 HP Compr.  
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#### With Option to Purchase Rebuilt — A1 Condition

1 13½ cy LeTourneau Scraper  
1 48B Bucyrus-Erie Shovel 2 cy diesel  
1 Model 6 N.W. Shovel 1½ cy diesel  
1 Model 25 N.W. Shovel ¾ cy diesel  
1 Caterpillar D8 Bulldozer  
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Final closing date is the Fifteenth of the preceding month. Magazine is issued 1st of publication month. If proof is desired, copy must be received 5 days preceding closing date.

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HD-5G A-C Front End Loader completely rebuilt. New rails, sprockets, rollers, idlers. Engine, clutch, transmission and hydraulic pump overhauled. Machine was new 1951. Price f.o.b. Fort Wayne, Ind. \$8,000.00  
Northwest 25 Dragline-Clamshell, gasoline power, s/n 5315, 40-ft. Boom, crawlers rebuilt. New swing clutches, New deck gears. Machine approximately 10 to 13 years old. Good operating condition.  
Price f.o.b. Fort Wayne, Ind. \$3,250.00

Photos available upon request.

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1 Ransome 34E Dual Drum Paver, powered by Cummins Diesel. F.O.B. Detroit, Michigan — \$12,000.  
1 Bucyrus-Erie 10-B shovel with crane boom attachment, Hercules gas powered with spare motor block.  
1 Used ½-yd. Insley gas-powered dragline, less bucket. In good shape.  
1 Schield Bantam ½ yard backhoe on half track.  
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All in good condition and reasonably priced.

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Bucyrus-Erie, 12-14 Scraper	GMC Model 450 Dump Trucks
Woolridge, 14-16 Scraper	Schlusser Cable controlled Heavy
Daniels, 5-8 Scraper	Rooter
10 cu. ft. Knickerbocker Mixer	Huber Medium Grader
700 Markham Shores	Adams #12 Grader
Lima Paymaster Crane	30 HP Tank Car Heaters
180 Worthington Compressor on	T D 18 Bulldozers
Wheels	Massey Harris End Loaders
<b>All Above in A-1 Operating Condition</b>	
<b>Or Will Trade For Following or What Have You</b>	
#2 Vulcan Steam Hammers	Cabin Cruisers
Wobble Wheel Rollers	Boats with outboard motors
3 Wheel 10 ton Roller	Trailer Homes
Single Drum Sheepfoot Rollers	Backhoes for Lima Paymasters
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NOT STRIPPED! Exactly as removed from service. Original Wheels and Tires — no power — can be towed anywhere! Bargain price. Overall dimensions: 35 feet long, bumper to bumper, 6 ft. 8 in. high inside, 8 ft. 1 in. wide inside, 16 seats, 36 passengers. 6 1/2x2 14-ply tires.

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SONKEN-GALAMBA CORP., 2nd & Riverview (B-10)  
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#### One Model 480 Marion Steam Shovel

In good operating condition; at a price that is bound to move it.

THE WESTON &amp; BROOKER COMPANY

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### FOR SALE OR RENT

- 1—Model 25 Northwest Backhoe. Used less than 100 hours.
- 1—Model 70 Buckeye with shovel front and crane boom, poor condition.
- 1—LeRoi Tractor — 105 c.f.m. with triple tappet attachment, excellent.
- 1—Rey II-S concrete mixer, excellent.
- 1—Barber ½ cu. yd. concrete bucket, excellent.
- 1—Vibro-Plus concrete vibrator, excellent.
- 1—Herman Nelson heater, excellent.
- Other miscellaneous items.

BRYCE BLACK

Dell Rapids — S. D.  
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### DEPENDABLE USED MACHINES

Pioneer 17V port. gravel plant — Bay City ¾-yd. dragline — Ransome 4½-yd. truck mixer — Koehring 1-yd. shovel — Galion motor grader — 40-ft. bucket elevator.

TRACTOR & EQUIPMENT CO.  
10032 Southwest Hwy. Oak Lawn, Ill.

### Hard Facing Welding Rod

SIZE 1/8 x 12"

Mfd. by Harnischfeger. This rod is for welding gears, truck and shovel parts.  
**50c PER POUND - ANALYSIS:**

Chromium	3.7	Vanadium	1.0
Molybdenum	8.1	Carbon	.6
Tungsten	1.8	Manganese	.25

Original price \$2.25 per lb.

Excellent condition, packed in 50 lb. boxes, sold in quantities of 200 lbs. or more, F.O.B. Laurel, Maryland.

SAMPLE SENT ON REQUEST

### NATIONAL ENTERPRISES

20th & K St., N.W., N.A. 8-0320, Wash., D.C.

### TRUCK CRANE

Trade or Sell — MICHIGAN TM16 Mounted on Mack 10-Wheel Truck, 60-ft. Boom, PRICE \$6,000.00

ANDERSON EQUIPMENT COMPANY  
P.O. Box 1737, Pittsburgh 30, Pa.  
Phone: LHigh 1-6020

### FOR SALE

Shovel Front for Link-Belt Speeder Model LS-71, in A-1 condition.	\$1,500.00
Shovel Front for Model LS-50 Link-Belt Speeder, Good condition.	\$1,000.00
Shovel Front with 3½ yd. Bucket, Fits either Model LS-40 or LS-50 Link-Belt Speeder. Rebuilt, like new.	\$850.00
Hystaway Dragline Attachment with 30' boom and attaching group for mounting on Caterpillar D7 Tractors. Has been used only for demonstrations.	\$3,500.00
DoMor Elevating Grader with 19' carrier complete for mounting on Caterpillar No. 12 Motor Grader. Has been used only for demonstrating.	\$4,000.00

**Burford-Toothaker  
Tractor Company**

P. O. Box 1591 - Telephone 2-0306  
MONTGOMERY, ALABAMA

### FOR SALE

1 P & H — 1 yd. crane, 40 ft. boom, recently rebuilt, \$6,500.00
1 Warren No. 512 Asphalt Plant, 2,000 pound batch — complete — \$8,500.00
1 TD-18 Tractor w/bulldozer, good condition \$6,000.00
1 Robins 18" conveyor belt tripper \$250.00
1 Sturtevant Air Separator, 6 ft., good condition, \$1,000.00
1 Century Electric Motor, 75 HP, 600 RPM, 220, volt, 3 phase, \$650.00

Above f.o.b. our plant

**Daws Silica Mining Co.**  
THOMASVILLE, GA.

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LIMA 802 — 2 Yd. diesel shovel and clamshell, late model, like new.  
LIMA 802 Shovel front complete — brand new.

A complete set of LIMA 802 Parts to convert long crane crawlers to standard shovel crawlers.

All above located here  
REAL BARGAINS

Construction Equip. Corp.  
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### FOR SALE

1—Caterpillar D7 crawler tractor, Ser. No. 3T8885P, with LaPlant-Choate Dozer No. 899.
1—Martin 32 ton machinery trailer Beaver tail, Ser. No. 4270, with IHC tractor, air brakes, 5th wheel, 567 cu. in. P.D., 25,000 lb. winch.
1—Seaman industrial Pulvi-Mixer, Buda diesel power.

The above equipment is in excellent condition and priced to sell.

Arthur Perrenoud & Co.  
39 Jefferson Ave., Chippewa Falls, Wis.  
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# Used and Rebuilt Equipment

## Clearance Sale



Minneapolis Moline Model RTI Tractor with  $\frac{1}{2}$  Yard Ottawa Loader. Equipped with dual tires in rear and counter-weight box. Tires good . . . motor tuned up. Located Rock Island, Ill. Price \$1,000

### Tractors & Tractor Attachments

TD-18A with Pullman Hydraulic Bulldozer. 1953 model, in excellent condition. Located Springfield, Ill. Price \$9,500.

TD-18A with Pullman Cable Angledozer Model HHL Double Drum PCU. 1952 model. In very good shape. Located Morton, Ill. Price \$9,000.

TD-18 with LeTourneau Cable Tilt Type Bulldozer and Double Drum PCU. 1946 model. In very good shape. Located Springfield, Ill. Price \$9,000.

TD-9 with B.E. Hydraulic Angledozer. 1946 model. Machine in A-1 condition. Located Rock Island, Ill. Price \$4,000.

TD-9 with B.E. Hydraulic Angledozer. In A-1 condition. Located Morton, Ill. Price \$3,975.

TD-6 with "NEW" Heil Hydraulic Bulldozer. In excellent condition. Located Morton, Ill. Price \$3,500.

TD-6 Tractor — Bare. 1946 model. In excellent condition. Located Springfield, Ill. Price \$1,500.

AC Model "S" (Gas) with Baker Hydraulic Angledozer. In good condition. Located Rock Island, Ill. Price \$2,500.

AC HD-5 with LaPlant-Cheote Hydraulic Bulldozer. 1948 model. Engine has only 25 hours on it. In excellent condition. Located Springfield, Ill. Price \$3,995.

Cat D-8 with push plate. Engine runs good. Master and steering clutches okay. Final drives okay. Track assemblies in fair condition. Located Springfield, Ill. Price \$2,000.

Cat D-7 with LaPlant-Cheote Hydraulic Angledozer. Condition looks good. Located Springfield, Ill. Price \$2,900.

Cat RD-6 with Balderson Hydraulic Bulldozer. Dozer only about two to three years old. Tractor in very good condition. Located Springfield, Ill. Price \$2,750.

Cat Model D-50 Bare Tractor. Located Rock Island, Ill. Price \$750.

Cat Model 50 (Gas) Bare Tractors. Two Located Springfield, Ill. Price, \$750, each.

Cat Model 22 (Gas) with Dozer. Located Springfield, Ill. Price \$1250.

Avery Bare Wheel Tractor. Located at Springfield, Ill. Price \$125.

Farmall "H" with Model 85 Auburn Trencher and Front mounted Winch. Practically brand new. Used couple of times as demonstrator only. Has 5' boom and an extra 3' boom. Located Morton, Ill. Price \$3,500.

Front End Loaders

TD-14A with 2 Cubic Yard Hough Hydraulic Loader. 1951 model. In nice shape. Located Springfield, Ill. Price \$7,000.

T-6 with  $\frac{1}{2}$  Cubic Yard Hough Hydraulic Loader. 1951 model. In A-1 condition. Located Rock Island, Ill. Price \$4,000.

Ford Tractor with Wagner Loader plus Dearborn mower . . . leveling blade . . . and scoop. Rig in A-1 condition. Located Morton, Ill. Price \$1,500.

### Motor Graders & Maintainers

Adams 414 Grader. Equipped with scarifier . . . cab . . . heater . . . defroster and windshield wiper. Located Springfield, Ill. Price \$250.

Adams 302 Grader with scarifier . . . and cab. Located Mattoon, Ill. Price, \$500.

Adams 50 Grader. Tandem drive . . . leaning front wheels . . . 12' moldboard . . . cab . . . wiper . . . and lights. Tires in good condition. Located Rock Island, Ill. Price \$1,250.

Cat 12 Grader. Equipped with scarifier . . . electric starting . . . cab . . . heater . . . defroster fan . . . lights. Very nice condition. Rear tires fair. Located Morton, Ill. Price \$6,250.

Cat 112 Grader equipped with electric starting, scarifier, cab and heater. In very nice shape. Located Morton, Ill. Price \$5,900.

Cat 212 Grader. 1950 Model. Equipped with scarifier . . . cab . . . heater . . . windshield wipers. Engine and tires in good condition. Located Morton, Ill. Price \$4,750.

Cat 212 Grader equipped with scarifier . . . cab . . . hot water heater . . . and windshield wipers. Engine runs good . . . tires good. Located Rock Island, Ill. Price \$4,500.

Warco Grader. 12' blade, leaning front wheels, scarifier attachment, electric starting from cab, cab and heater. In very nice shape all around. Located Morton, Ill. Price \$4,500.

Warco Grader with 12' blade, leaning front wheels, scarifier attachment and electric starting from cab. Ready to drive away. Located Springfield, Ill. Price \$4,000.

AC Model "S" grader with tandem drive . . . leaning front wheels . . . cab . . . and windshield wiper. Tires in good condition. Located Rock Island, Ill. Price \$750.

AC "WC" Maintainer (Gas). 10' blade,  $\frac{1}{2}$  yard, DoMor hydraulic front end loader and drawbar. Unit is in very nice condition. Located Springfield, Ill. Price \$975.

American No. 8 Maintainer (gas), 40 h.p. with 12' blade, leaning front wheels, hydraulic controlled. V-type snow plow from seat, electric starting, lights and electric hour meter. Overall this grader is in excellent shape. Located Morton, Ill. Price \$1,900.

Trojan Maintainer — Model PM 10-45 (gas) with 10' hydraulic controlled blade and slide shift moldboard. Tires okay and overall condition in good. Located Springfield, Ill. Price \$1,500.

# A. E. HUDSON COMPANY

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**Truck & Industrial Parts Co.**

724 So. 2nd Street

Nashville, Tennessee

**EQUIPMENT FOR SALE:** 1948 Diamond T water truck and tank, \$600; Davis tilting mixer, 3 cu., \$600; Koehring paver #750, Waukesha engine #53RRK329, \$2500; Unit shovel IF 603 w/Chrysler Ind. motor, 9-228184, \$4000; Allis-Chalmers tractor w/Garwood dozer, cable control unit, Torque converter drive, serial #25971, model #HD14C; Allis-Chalmers tractor w/Garwood dozer, motor, #DT196, serial #2315, model #HD14, \$5000; TD-14 IHC tractor (crawler) #659 w/Heil dozer & power unit model S-2, serial #TDF757617BH, \$1500; D-7 Caterpillar tractor w/B' dozer blade & LeTourneau double drum cable control assembly, \$4000; Mix & Truck Units: 1941 International model K10 tandem axle, engine #B2CA401602, serial #1053; Rex transit mixer, 4 cu., serial #TF1188, Waukesha engine #290103, model #BLH85H, \$3500; 1945 Mack, model #KHX tandem axle engine #EN354A16680, serial #EXHID8117, Rex transit mixer, 5 cu., serial #TF144, Waukesha engine #473716, model 6 BL85H, \$4000; 1945 International model K8, tandem axle engine #23906, serial #2841; Ransome mixer, 5 cu., serial #27074, Hercules motor, #AP2834237, \$3000; 1945 International model K8, tandem axle 6x6 engine #RED361-1394, serial #MM-6-56; Jaeger transit mixer, 4/5 cu. serial #JBB17-C, engine #31737, \$3500; 1944 International, tandem axle 6x6 engine #RED361831350, Rex transit mixer, 4 cu., serial #TF223, \$3500; 1944 Ford, tandem axle, Cook Brothers, chain drive engine, #N17004; Ransome transit mixer, 5 cu., serial #2890, Hercules engine #AP2833652, \$1900; 1947 Chevrolet tandem axle, Cook Bros. chain drive engine #N124822, Ransome transit mixer, 5 cu., serial #31047, Hercules engine, #1500; 1946 Ford, tandem axle, Cook Bros., chain drive, engine #6997-765448, Rex transit mixer, 4 cu., serial #TF113, engine #496097, model #BLH85H, \$2000. All above items are priced where is, as is; available subject to prior sale. Can be seen and inspected at: Albuquerque Gravel Products Co., 515 John St. S.E., P.O. Box 1352, Phone 2-5265, Albuquerque, New Mexico.

**LIST OF EQUIPMENT FOR SALE**

**RANSOME PAVER — DUAL DRUM** model 34E—Serial No. 15991—Brand New Cummins Diesel — HI-600 Eng. 73743. Excellent Condition.

**ATHEY LOADER Model L Force Feed Loader** — 100 HP — V8 Engine Ser. L031-579. Excellent Condition — Practically New.

**ALLIS CHALMERS TRACTOR** Model HD-19H — Diesel 84" — Serial #385 Tread Track Type — Motor 62A-866 w/std track, hour meter, canopy type, also equipped with Baker Model 19V, Hyd. Bulldozer. Completely overhauled.

**SCRAPER — MFG. BY LA PLANT CHOATE MFG. CO.** — Model CAB-167 Self Loading Towed Type — Hydraulic 1½ Cu. Yd. — Cap. 2 Yds. Weight 2400#. NEVER USED.

**BLAW-KNOX FORMS** — 7000' 8 inch, 2000' 9 inch, 10 Footers — Good Condition.

**Frank Mascali & Sons, Inc.**

120th St. and 31st Avenue  
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Tel. Independence 3-1500

**FOR SALE**

D-7 Caterpillar Tractor — S/N 3T20053 equipped with metal cab — Hydraulic Bulldozer — 2400 hours on machine — new rails were put on in early Spring and rollers were rebuilt. New in 1952 \$11,500.00 Unit 1020-A, ½ yard Crawler Crane — S/N 51176 complete w/10' boom, 15' jib — powered by GMC Diesel Engine — 30° pads. New in April, 1951 \$12,500.00 Unit Truck Crane — Model 1020 — ten ton capacity — S/N 47485 complete w/70' pin connected boom, 12' jib power driven boom hoists — mounted on Available Truck. New in 1947 \$12,000.00 Caterpillar Cable Hi-Lift Tractor, S/N 7U1667 \$1,500.00 International TD-14 Tractor, S/N TDF-23903 equipped with Bucyrus Erie Dozer 10' blade \$3,500.00 Fairlead for Model 190-T-61 Bay City — New Condition \$200.00 Unit — ½ yard Backhoe attachment — Good condition \$1,500.00

**NORRIS CONSTRUCTION CO.**  
9349 S. Eggleston Ave. — AB 4-9006  
CHICAGO, ILLINOIS

**FOR SALE**

*Rebuilt and Guaranteed*

Allis-Chalmers HD-15A Tractor with Baker 15-G Hydraulic Grade-builder ..... \$13,000  
Allis-Chalmers HD-9G 2-yd. Tractor-Shovel ..... \$14,000  
Allis-Chalmers Model HD-5B Tractor with Gar Wood Hydraulic Bulldozer and Carco Logging Winch ..... \$6,750  
Parsons Model 310 Trencher — Excellent Condition ..... \$7,000

*Write, Wire, or Phone*

**McClung-Logan Equipment Company, Inc.**

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**FOR SALE**

Koehring #34 E. Dual Drum Paver #19910.  
Lima #34 Paymaster Crane, Dragline #4831.

Lorain L-50 Crane, Dragline #20440. Cat. #12 Grader #8T 1331. Cat. #12 Grader #8T 3027. Cat. #12 Grader #8T 3706. R B Finegrader S/N #405. Model 848 Barber-Greene Asphalt Plant Complete.

Cat. #20 KW Light Plant. Cat. #D8 Tractor IH 9738. Hopkins Low Pressure Burners. Butler 250 Bbl. Cement Bin Complete.

*All of above equipment located in Southeast*

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79 Lorain Shovel.

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1201 Lima Dragline.

1205 P&H All Electric Shovel.

855 P&H Combination Shovel and Dragline.

LeTourneau Scrapers. RUW&NP. Bucyrus 120-B Dragline Attachment.

*Catalogue Of Used Equipment  
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General Crane ½ yd. 35' boom — 10' insert (factory overhauled)

TD-6 Hi-lift (complete new diesel)

T-6 Bulldozer

Galion 10 Ton Master roller with scarifier

KB-7 Int. tractor with fifth wheel

22' Trailer — Pickup trucks — Trucks

Welder pneumatic tires — Concrete bucket — Tar kettle

Dragline & Clam buckets

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Generators 1500 Watt belt driven for Cranes

General shovel boom

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The Construction of the Brooklyn-Battery Tunnel. This is the story of the key men of the miraculous 20th century — those hardy human sandhogs who dug under water and blasted through earth and rock to build the sleek, modern tunnels we use today for fast motor and railroad traffic. Illustrated and photos. Per copy ..... \$1.00  
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# AN AUCTION

## EXCEPTIONAL SALE OF LATE MODEL EQUIPMENT

**ATLANTIC, IOWA**

**Oct. 18th, 11 A. M. (CST)**

**The Largest Quantity of Late Model Excellent Equipment Ever To Be Sold at Auction. Monday, Oct. 18th, located 9 miles East of Atlantic, Iowa, on U.S. Hiway 6, or 70 miles East of Omaha.**

### Caterpillar Tractors

Nine Caterpillar D-8 Tractors: Serial Numbers — 2U-20926, 2U-20784, 2U-20623; these 3 have Cat No. 25 DDPCU's, are about one year old and excellent throughout. Serial Numbers 2U-18101, 2U-17848, 2U-17741, 2U-16721, 2U-16262, 2U-16256; these 6 D-8's all have push plates, they have the pistons, rods, heads and counterbalance which make them the same as the 150 hp new 13A series D-8's. Each of these has been completely rebuilt from ground up and is in top condition throughout. Cat. D-8, S/N 2U-3536, has push plate and is in good condition. Cat D-4 HT4 Tractor Shovel, S/N 7U-7014, excellent condition. 2 Cat D-6's, New Nov. 23, 1953 (less than one year old) S/N 9U-14816 and 9U-13686, wide gauge, each has No. 25 DDPCU and Cat cable dozer. Like new condition. Cat D-7, S/N 4T-3659, good condition. 2 I-9 IHC wheel tractors.

### Seven Caterpillar DW-20's and DW-21's

2 Cat DW-21's, rubber is good, have complete factory modifications on motors and pumps, excellent shape throughout. S/N 8W-87 and 8W-199.

5 Cat DW-20's, good rubber, have the complete new factory modifications on the motors, excellent condition throughout. S/N 21C-430, 21C-413, 21C-199, 21C-196, 21C-194.

### Motor Graders & Scrapers

3 Cat No. 12 patrols, S/N 8T-9942, 8T-5024, 8T-1954; each has hydraulic booster steering, cabs, 13:00x24 tires all around and good rubber, very good shape throughout.  
1 La Plante Choate C-108 and 2 C-314 Scrapers, good rubber and good scrapers.  
LeTourneau LP Scraper, good condition.  
Garwood 524 scraper — good.

### Trucks & Miscellaneous

3 No. 25 Cat DDPCU's; Cat 8S dozer—excellent; 4 Blaw-Knox and Ferguson dd sheepfoot rollers; LeT square foot dd sheepfoot; UD-14 power unit with Roger light plant—Completely rebuilt; 7 Chev. and Ford pickups; 4 F-6 Ford 5-yd. dump trucks, '50 and '52; KB6 '50 5-yd. dump truck; '49 Ford F8 dump truck 7-yd.; other trucks; Jaeger 60-cfm. compressor; 6 new heads for D-8's; LeT angle dozer and DDPCU for D-8; other pieces.

*Write — Wire Auctioneers for Complete Descriptive Sale Bill. Inspection may be made anytime after October 8th. Complete work orders are available on each piece of equipment to show exactly what has been done and may be inspected. Do Not Fail To Attend This Sale If you Are in Need of Excellent Late Model Equipment!*

**Each Piece Positively Sells to the Highest Bidder  
Without Limit, Minimum or Reservation**

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*the Auctioneers*

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— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

TERMS: — Complete payment Sale Day. Cashier's Check, Certified Check or Bank Draft Accepted. Only when accompanied by letter of credit will personal checks be accepted.

All of this equipment is owned by Mr. Orville Eblen, Atlantic, Iowa, Ph. 638. ORVILLE EBLEN, Owner

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**Johnson Central Batch & Mix Concrete Plant**  
w/225 ton 4 compact. Aggregate bin plus 90 bbl. cement storage & 2 cu. yd. batcher. 2241 bbl. steel bolted silo, cement screen & elevator, air compressor. Modulating 56 ft. cu. yd. Motor 5-12-2 deck vibr. screen, water tanks, 250' x 24' inclined conveyor, 140' x 34' tunnel conveyor & 140' x 34' multiplate tunnel, motors, etc. Plant now 1951. Used only one job 60,000 cu. yds. Complete f.o.b. \$35,000.00. Also smaller plants.

**Lorain L-41 Heavy Duty ½ cu. yd. Heavy Duty shovel.** Cat. Diesel power unit. Good. Ser. #17140. New 1948. \$7000.00. Rental \$90/mo. apply purchase price.

**Indy Motor Crane,** ½ cu. yd. mounted factory. 2 cu. yd. capacity powered with Cat. Hercules Diesel. 10,000 x 30 rubber. 45' boom, fairleads. Bud Omatic tailing fore and aft outriggers. Used only 651 since new on one job. Bargain rent \$650/mo. apply purchase price. \$13,500.00. Can furnish backhoe att. extra. Orig. cost was \$19,000.00.

**SA — Lorain TL-25 Dragline,** ½ cu. yd. Cat. Diesel. Including ¾ cu. yd. Hendrix bucket. New late 1952. Bargain \$8500.00. Consider rental purchase.

**Bucyrus-Erie 54-B 2½ cu. yd. Shovel.** Buda Diesel. 610C-1879. New 1947. Good. \$29,000.00. California.

**McCaffrey new Clamshell & dragline buckets.** Rent half AED's rentals and apply purchase price. Sizes ½ cu. yd. to 2 cu. yd.

**Bay City Dragline bucket.** New. ½ cu. yd. \$500.00.

**Hendrix Dragline Bucket.** Like new. TH. ½ cu. yd. \$1200.00.

**Hendrix Dragline Bucket.** Like new. TH. ½ cu. yd. \$800.00. Also other clams & drag buckets. Various makes and sizes.

**Erie ½ cu. yd. Re-handling Clamshell bucket.** Like new. \$500.00.

**Rogers 2-unit Crushing & Screening Portable Plant.** 20' x 30' BB Jaw, 3' x 8' apron feeder. GMC Diesel. Underconveyor. Tandem axle. Secondary 30' x 30' Hammermill. 2 deck 4' x 10' vibr. screen. Twin 6-7 Diesel. Tandem axle. Generating plant for electric motor. Consider rental monthly or annual basis. \$25,000.00. Also semi-portable practically 20' x 40'. BB Rogers with Hammermill. GMC diesel powered. Excellent. \$20,000.00. If you have good location for this plant, consider partnership on new venture.

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**Butler Cement Car Unloader.** Good. \$600.00. Elgin Jr. Street sweeper. Gutterbrone. Rebuilt. \$900.00.

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**Master Concrete Vibrator, model 23U.** Wisconsin Power units. AHN 4 ½ H.P. Rubber tired wheelbarrow mounting. A.L. \$225.00.

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**LeTourneau Cable Scraper.** 4-wheel. 4 tires. 4 cu. yd. \$500.00.

**Wenzel Machinery Rental & Sales Co.**  
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*Guaranteed Rebuilt*

**1951 Model D8 Caterpillar Tractor**  
No. 2U14094 with Caterpillar Double Drum Power Control Unit & Angledozer. Like New. Price Reasonable.

Will trade for other equipment.

**ANDERSON EQUIPMENT COMPANY**

P.O. Box 1737, Pittsburgh 36, Penna.  
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Caterpillar D4 wide gauge Tractor. 1947 with nearly new Cat scraper controls with LaPlant Choate Angledozer. Good condition.

**L. A. Fairbank**

R. D. 4 Phone 9-4327  
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**I—Used Buffalo-Springfield 3 Axle Tandem Roller — Model KX-16, 9 to 14 Ton.** Machine in good working condition — Priced to sell. Immediate Delivery. Located in Rapid City, South Dakota.

WRITE OR WIRE DEPT. RS-5 . . . OR PHONE HARNEY 8733

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OMAHA, NEBRASKA

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**Cedarapids Pitmaster Gravel Plant** — in excellent condition — completely overhauled — has only run 150,000 yards — complete with 1016 Cedarapids roller bearing jaw crusher, 1616 Cedarapids roller bearing roll crusher, 30"x9'5" double deck Cedarapids screen, mounted on pneumatic tires with air brakes. \$17,000.00.

**JAMES W. BELL CO., INC.**

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### PLANT SUPERINTENDENT

**Asphalt Plant — Year-Round. Location in the East.** Must be neat and capable of taking full charge. Apply giving full qualifications, age, etc. Box No. 1141 —

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### FOR SALE

**Barber-Greene Asphalt Plant** 60 tons per hour continuous mix including B42BG mixer, 836BG graduation unit, BG Hot & Cold Elevators, 834BG Feeder, 811BG Fines Feeder, Cyclone dust collector, 832-BG Dryer, 66HP Oil Automatic boiler with 5000 gal. fuel storage tank and 10,000 gal. cooled asphalt storage tank. All in good condition. \$28,000.00

**Roller, Galion Tandem, 8-12 ton, gas engine, hydraulic steering, very good condition, water system.** \$3,500.00

**Roller, Huber, 3 wheel, 10 ton, gas engine, water system, good condition.** \$2,000.00

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**No. 12 Cat motor patrol.**  
**400 c.f. Cat diesel compressor**  
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Winches removed from front of GMC Army Trucks.  
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One (1) PIONEER 305-W Washing Plant Complete with log washer (Eagle), buzzer screen, hopper, feeder, conveyor and motors.

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6x6 G.M.C. lower mileage	1250
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32 volt DC 1 cylinder Briggs Stratton, each	75
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1,000 Dusik wheels for 10.50x20, fits GMC 6x6 or Int., each	5
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Purchased Jan. '52 \$ 7,500

1—22B Backhoe (BUCYRUS-ERIE).  
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\$15,000 inventory of new major component parts. A good rounded inventory for an operator with 2 to 4 tractors. Write for inventory lists.

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Blaw-Knox XC Finisher CB 2398  
Barber-Greene Undertrack Conveyor  
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2 International ID 6 Tractors  
Model M Farmall Tractor  
Model H Farmall Tractor  
Buffalo-Springfield 3 Wheel 10 Ton  
Roller  
Seaman Pulvimer  
Woods Model 54 Roadmixer  
Cleaver-Brooks Tank Car Heater

Above equipment located in  
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**VANDEVENTER AUTO SALES**  
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**Construction Superintendent**

Construction company located in Pennsylvania requires the services of a man who is capable of taking complete charge of road construction, grading, drainage, and paving.

Applicants must have had previous experience and successful record in similar capacity. Give age, particulars of experience, and references. Must be available immediately. All replies will be treated strictly confidential.

Box 1138 — ROADS & STREETS  
22 W. Maple St. Chicago 10, Ill.

## Manufacturers' Literature

(Continued from page 109)

### Tractor Mounted Trencher

Features of the Universal trencher are illustrated and described in a 4-page circular available from Heller Engineering & Mfg. Co., 11750 South Alameda St., Lynwood (Los Angeles County), Calif. This machine is built for mounting on the Oliver Model OC 3 crawler tractor. It has a digging dept of 4 ft. and a digging width of 14 in., 16 in., and 18 in. with belt on clearance teeth. It has six digging speeds from 15 in. to 13 ft. 6 in. per minute. It has two road speeds 2 to 5.25 mph.

### Roll-O-Matic Tandem Roller

An interesting new catalog on an advanced type of tandem roller drive called "Roll-O-Matic" is available from The Galion Iron Works & Mfg. Co., Galion, O. The Roll-O-Matic drive utilizes a torque converter made by Allison Division of General Motors. This new drive is reported to set a new standard of effective driving power and to accomplish worthwhile reductions in fuel consumption, mechanical wear, and maintenance. It is pointed out that the elimination of gear shifting and master clutch makes the Roll-O-Matic drive tandem roller extremely simple to operate. Reversing ac-

tion is velvet-smooth. Any selected roller speed is closely and automatically maintained — uphill, on the level, downhill, and around curves. Other construction features of Galion tandem rollers are fully illustrated in the catalog, and complete specifications are listed.

### Lamps for Street and Highway Lighting

Complete technical data on lamps for street and highway lighting is given in a new 8-page booklet (S-413) by the Westinghouse Electric Corporation, 401 Liberty Ave., Box 2276, Pittsburgh 30, Pa. Designed as a selection guide, the booklet gives information on all lamps in common use as well as others recommended for this type of service. Four charts present data on mercury lamps, and series and multiple type lamps, both for standard service and group replacement. The data includes such information as mean lumens, lumens per watt, initial lumens, and physical dimensions.

### Replacement Parts for Dragline Buckets

Replacement parts for any make or model of dragline bucket are described in a new 28-page catalog released by Electric Steel Foundry Co., 2141 N.W. 25th Ave., Portland 10, Ore. This parts catalog is stated to contain information of value to the owner or operator of any make or model of dragline bucket. Typical examples are: information on how to determine proper drag chain length;

drag and hoist chain specifications; maintenance tips and alloy recommendations. Also included is information on several new products such as the new Esco "Spring Lock" hinge repair links for drag chains.

### Fiberglas Expansion Joint

A 4-page brochure describing the physical makeup and applications of fiberglas expansion joint has been prepared by General Products Division, Owens-Corning Fiberglas Corporation, Toledo 1, O. The booklet contains complete information concerning expansion joint application on projects involving highways, streets, sidewalks, parking areas, drives, airports, bridges and general construction. Weight tables, widths and thicknesses also are included in the booklet.

### Tractor Shovels in Pit and Quarry

A recent publication (No. 272) of The Frank G. Hough Co., 890 Seventh St., Libertyville, Ill., shows how various sizes and types of "Payloader" tractor-shovels are used most advantageously in the pit and quarry and around the plant to handle raw and processed materials. Some of the "Payloader" operations shown and described are: loading from the pit; charging conveyors; loading dump trucks; building stock piles; trimming piles; clean-up work around big power shovels; moving crushing and washing plants, compressors and other

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**The Parkway** HOTEL  
2100 Lincoln Park West

equipment; land clearing and overburden stripping. Many useful attachments are illustrated.

### Bodies and Hoists

A new 2-color, 4-page catalog descriptive of Galion Allsteel Model 12N-3 bodies and Model 600, 700 and 710 hydraulic hoists has been announced by The Galion Allsteel Body Co., Galion, O. The new folder is profusely illustrated with action photos, line sketches and cut-away views. Construction details and mechanical features of bodies and hoists are discussed, with special emphasis on exclusive features of Galion products. Full specifications are included.

### Portable Batch Type Asphalt Plant

A Bulletin (No. 541) on its new Model TM portable batch type asphalt plant is available from Standard Steel Corporation, 5001 South Boyle Ave., Los Angeles 58, Calif. One of the main features claimed for the new plant is speed of erection. The exclusive standard "Self-Lift" erecting device is stated to permit the entire mixing cage to be raised in less than 30 minutes. Entire plant can be made ready for operation in about one day. The bulletin covers all features of the plant including gradation and weight control and stresses portability combined with a capacity of 40 to 50 tons per hour.

A typical city's comment\*

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- Digs through hard asphalt and frozen ground 8½' deep
- Ideal for spot excavations
- Adaptable to most all tractors
- Loads trucks—½ yd. Clam Capacity

Purchase this machine for less than the cost of excavating jobs. All hydraulic operation. Digs straight down, forms square corners and level bottom of excavations.

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TO 9' DEEP—ONE MACHINE FOR TWO OPERATIONS!

\*name on request

**SHAWNEE MANUFACTURING CO.**  
1947 G N. Topeka, Topeka, Kansas

### Athey Universal Trailer

The new Athey universal trailer, designed to haul heavy and bulky loads wherever a track type tractor can travel, is the subject of a new folder issued by Athey Products Corporation. Its construction, features, specifications and applications are described. The method of converting the trailer for specific uses is illustrated in the 4-page booklet. Copies are available by writing Athey Products Corporation, 5631 West 65th St., Chicago 38, Ill.

### Chippers Solve Brush Removal Problem

A new illustrated booklet, "Real Brush Eaters," issued by Fitchburg Engineering Corporation, Fitchburg, Mass., tells how brush and trimmings can be converted on the job to easy to dispose of wood chips, saving man-hours, hauling expense, and avoiding brush burning hazards.

### Welding and Cutting Equipment

A new condensed 52-page catalog (ADC662B) that describes and illustrates all of the Airco products used by job shops, maintenance departments and other users of light welding and cutting equipment, is offered by Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y. This catalog covers Airco gases, welding and cutting equipment and accessories — torches, tips, regulators, elec-

trodes, etc. It also includes three of Airco's latest developments — Airco-spot (inert-gas spotwelding), Easyarc 12 electrode and the new heavy-duty cutting attachments for Airco Torches.

### Electric Pre-Heater for Engines

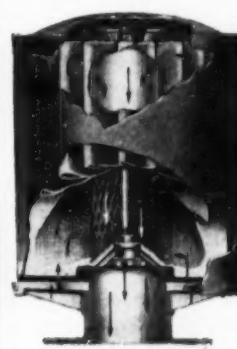
A booklet describing the Kim Hotstart, an electric pre-heater for diesel and gasoline engines is available from Kim Hotstart Manufacturing Co., West 917 Broadway, Spokane 1, Wash. The device plugs into any electrical outlet and through a percolator-like action keeps the engine ready for instant starting even when vehicles are stored outside in sub-zero weather. The attachment is said to effect substantial economies in warm-up time, engine wear and maintenance, battery-life, fuel consumption, and storage space. Typical installations are shown in the booklet and specifications listed for various sizes and types of engines.

### Willys 4-cylinder Industrial Engines

A new brochure describing Power Grant industrial engines, Model L-4 "Jeep" and Model F-4 "Hurricane," is available from the Industrial Engine Department, Willys Motors, Inc., 975 N. Cove Blvd., Toledo 1, O. Complete engine details are given both for the L and F head designs including power, torque and fuel curves at various rpm; special features; installation diagrams; and other general descriptive material.

"The Hydro-Clam Digger has exceeded our expectations of versatility, has been very satisfactory, and has resulted in material savings of time and money in the plant, in operations of this Department. We have found that the Clam Shell and the Back Hoe attachment can be interchanged by our operator, with a helper, in approximately twenty minutes. The Back Hoe has been able to remove up to 12 inches of frost, which would have been impracticable to do by hand."

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- Efficiency Actually Increases With Use.
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ALL TYPES OF  
FILTERS  
FOR EVERY  
INDUSTRIAL NEED

### Chain Saws

Literature is available from Lombard Governor Corporation, 36 Main St., Ashland, Mass., on four models of its new bow chain saw, its Model 35 chain saw, its Model 5 Lombard logger, its new Model 35D, a 27 lb. saw; and its Lombard chain saw with brush-cut attachment. The latter cuts trees up to 8 in. diameter, and cuts down brush and weeds as you would with a scythe. It is easily slung on by the operator unassisted and its design combines high speed operation with many desirable safety factors. Both hands are free for complete control in a natural scythe-holding manner of the complete unit that gives the operator protection from moving with the blade.

### 50 years of Crawler Tractor Manufacturing

An 8-page booklet (Form No. D438) depicting improved methods of crawler tractor manufacturing over the last 50 years has been released by Caterpillar Tractor Co., Peoria, Ill. The booklet, written in conjunction with the fiftieth anniversary of the crawler tractor, gives a brief history of track type tractor manufacture beginning with the building of the first practical crawler exactly 50 years ago by a parent company of Caterpillar. Illustrations showing product improvement through a half-century of research, scientific engineering and progressive manufacturing methods are placed throughout the book.

Highlighted also is the company's "no

parts orphans" policy. Established simultaneously with the building of the first tractor, this policy assures Caterpillar owners that parts are available for their machines no matter how old the units are or how long they have been in service.

### Concrete Vibrators

A new circular, No. 43, issued by White Manufacturing Co., Elkhart, Ind., contains a complete description of each of the company's concrete vibrator models. It illustrates and describes some new models recently added to the line. It also describes concrete grinders and soil grinders. Ten models of concrete vibrators are covered in the circular. Specifications for these models are included.

## FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

*THE Quinn Standard*

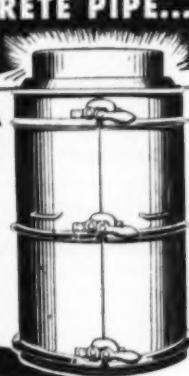
Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

#### • QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10' to 120' and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of  
QUINN CONCRETE PIPE MACHINES  
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### CRANKSHAFTS Rebuilt - Hard chrome surfaced CAMSHAFTS Reground Connecting rods rebuilt

Hard Chrome deposited on crankshafts by "Rotary Process" adds new shaft life. Shafts electro heat treated 3 times. Camshaft lobes reground to original lift.

All parts carefully magna-fluxed to detect hidden defects. Experienced Workmen—Specially Designed Machinery—Careful Inspection, guarantees each job.

Crankshaft Capacity  
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100" Length  
Write for Information and Prices.



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### Steam Cleaner

The new "Power Pak" motor steam cleaner is illustrated and described in a 4-page circular available from Industrial Engineering Co., Vermillion, S. Dak. This cleaner has a capacity of up to 80 gal. of water per hour. It has an operating pressure of 80 lb. or 100 lb., if desired. The fuel tank has a 6 gal. capacity sufficient for 4 hours of normal operation, using kerosene or heating fuels. The precision spacing of the helical heating coil is stated to assure high thermal efficiency and quick build up to working pressure from a cold start. It is stated that the "Power Pak" in 3 minutes will produce up to 100 lb. of steam pressure. The "Power Pak" is 37 in. high, 41 in. long and 21 in. wide. It is mounted on rubber tired wheels and weighs approximately 250 lb. crated.



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Rates from \$8 double,  
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Summer & Fall Season

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**MIAMI BEACH**

## With the Manufacturers and Distributors

**CHANGES OF OFFICERS OF INSLEY.** Insley Manufacturing Corporation, Indianapolis, Ind., has announced the following changes of officers: William B. Elliott, heretofore president is now chairman of the board of directors; James R. Elliott, formerly executive vice president is president, and William T. Elliott is executive vice president.

**NEW HEIL DISTRIBUTORS.** Roadway Mounting and Equipment Co., 21177 Mound Road, Van Dyke, Mich., has been appointed distributor of truck bodies and hoists by the Heil Co., Milwaukee, Wis., for the counties of Monroe, Washtenaw, Wayne, Oakland, Macomb and St. Clair, Michigan. Black Hill Oldsmobile-Cadillac, Inc., Rapid City, S. Dak., will handle Heil truck bodies and hoists in South Dakota counties of Fall River, Custer, Pennington, Lawrence, Meade, Perkins, Harding and Butte.

**CLARKE HEADS SALES FOR LESCHEN.** L. Jack Clarke, heretofore manager of the New York sales district, has been appointed general sales manager, Leschen Wire Rope Division, H. K. Porter Co., Inc., with headquarters in the division's main offices in St. Louis, Mo.

**AMERICAN HOIST NAMES SALES MANAGER.** Ray J. Dervey, heretofore district manager, has been appointed general sales manager of American Hoist & Derrick Co., St. Paul, Minn.

**"QUICK-WAY" ACQUIRED BY PENN-TEXAS CORP.** Louis T. M. Ralston, President of Industrial Brownhoist Corporation, Bay City, Mich., has been elected president of the "Quick-Way" Truck Shovel Co., Denver, Colo., according to an announcement by L. D. Silberstein, Chairman of the Board of Penn-Texas Corporation. Both companies have been acquired as wholly owned subsidiaries of Penn-Texas. Luke E. Smith, founder and former president of "Quick-Way"

will continue as consultant. It was announced that Wilson H. Madden has been appointed vice president and general manager of "Quick-Way."

**LARGEST AUCTION SALE IN KC AREA.** The largest equipment auction yet held in the Kansas City area took place on Aug. 15; a representative group of contractors and equipment dealers, conservatively estimated at over 1,200, attended. The equipment was all owned by the Perry McGlone Construction Co., Kansas City and consisted mainly of heavy dirt moving equipment. There was good interest in practically every item and the sale moved at a rapid pace starting at 9:30 A.M. and was through at 3:15 P.M.; 327 items were sold in 345 minutes. The equipment was sold to buyers from 21 states and three Canadian provinces. Quantities went to California, Ohio, Utah, Texas, Ontario and Manitoba, Canada. Each and every piece was positively sold as advertised. Each piece was sold without any minimum, limit or reservation. The sale was conducted by Forke Brothers, The Auctioneers, 321 Sharp Bldg., Lincoln, Neb.

**NEW WORLINGTON DISTRIBUTOR.** Construction Equipment Corporation, 457 Windsor Ave., Wilson, Conn., has been appointed distributor in the state of Connecticut for the construction equipment line of Worlington Corporation, Harrison, N.J.

**BIGGS APPOINTED EXECUTIVE VICE PRESIDENT.** Robert W. Biggs, until recently vice president of manufacturing of Ball Brothers, Inc., Muncie, Ind., has been appointed executive vice president of the S. K. Wellman Co., Bedford, O.

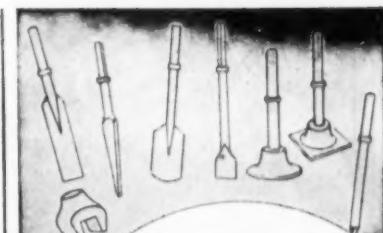
**NEW DISTRIBUTOR FOR GALION ALL-STEEL BODY CO.** Truck Equipment Co., 20-24 14th St., N.W., Atlanta, Ga., has been appointed Georgia distributor by Galion Allsteel Body Co., Galion, O., for its Allsteel hydraulic hoists and dump bodies.

**GRUET NAMED HYSTER REPRESENTATIVE.** Charles P. Gruet has been appointed Northeast district representative by Hyster Co., Portland, Ore., for its line of tools and attachments for Caterpillar tractors.

**ARMSTRONG JOINS INTERNATIONAL SALT ORGANIZATION.** Arthur R. Armstrong has been appointed to the highway sales organization of International Salt Co., Inc., Scranton, Pa. He will work out of the New York office.

**NEW BUCYRUS-ERIE DISTRIBUTOR.** Euclid Sales and Service, Inc., 5231 Manchester Ave., St. Louis, Mo., will handle sales and service of excavators and cranes of the Bucyrus-Erie Co., South Milwaukee, Wis., in 85 counties in eastern Missouri and west central Illinois.

**HYSTER APPOINTMENTS.** Lewis W. Krumbein has been named coordinator of lift truck promotion and Richard W. Taylor head of market research by Hyster Co., Portland, Ore.



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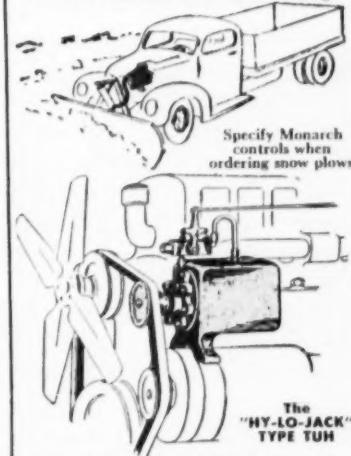
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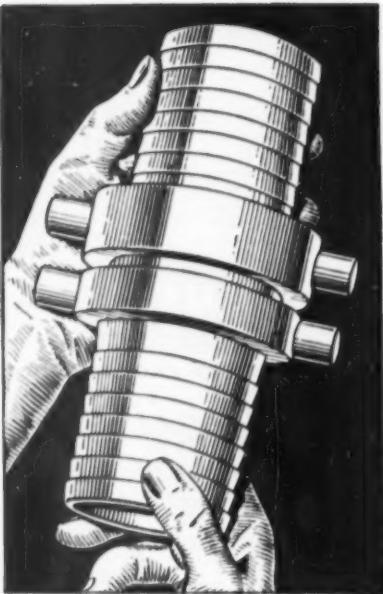
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... in 1 Portable, All-Weather Unit  
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# "Mack Trucks

## are a definite asset to our growth and progress..."



That's the way George T. McCarthy, president of The Silliman & Godfrey Co., of Bridgeport, Conn., feels about his present fleet of Mack trucks and about the Macks his firm has purchased through the years.

Commenting on his recent purchase of two Mack Model LJ six-wheelers, he says: "The foresight of Mack engineering has given us trucks particularly adapted to the severe

demands of concrete-mix operations. We have been especially impressed with the Mack engine and the Mack bogie, both of which are unequalled for this type of service. Our drivers have often remarked about their feeling of safety in knowing that reserve power is there when you need it."

As in the case of The Silliman & Godfrey Company, Mack trucks can be a definite asset to the growth and progress of *your* business, too. Get the full story from your nearest Mack branch or distributor, Mack Trucks, Empire State Building, New York 1, New York.

2638



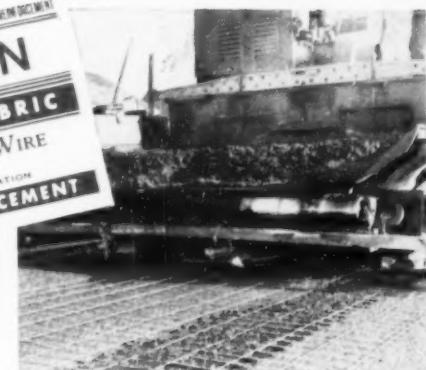


**CONCRETE HIGHWAYS** can be built to last longer and for less cost with longer slabs and fewer joints if they are reinforced with American Welded Wire Fabric reinforcement.

## The wire fabric that is better than the specs bears this red and white tag



**STREETS CRACK LESS**, stay smooth, and require less maintenance when they are reinforced with American Welded Wire Fabric. American Fabric prevents heaving, spalling, and pumping.



**MANY APPLICATIONS** of reinforced asphaltic concrete, some in service on test roads for many years, indicate that you should reinforce your next asphaltic concrete resurfacing job with American Welded Wire Fabric.

American Welded Wire Fabric offers the greatest assurance that reinforced portland cement and asphaltic concrete will be as strong and durable as design calculations indicate.

We make careful inspections at every stage of manufacture to make sure that quality is high. We check the steel, the wire, the welds, and the finished

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